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## **MARINE CATFISH RESOURCES OF INDIA**

**EXPLOITATION AND PROSPECTS**

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## THE FISHERY AND CATCH STATISTICS OF CATFISHES

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The catch statistics, species composition and seasonal abundance of catfish fishery are dealt with in this chapter based on studies conducted for varying periods during 1971-82 at seven different centres along the east and west coasts, viz. Waltair, Mandapam, Cochin Calicut, Mangalore, Bombay and Veraval.

### THE CATCH TREND

Silas *et al.* (1976), surveying synoptically the all-India catfish fishery, have given the catch statistics for the period 1962-74. Finding that the all-India catfish landings increased three fold from 1969 to 1974, (Silas *et al.* 1976, Fig. 8), they considered the catfish a potential demersal resource. But, analysing the survey data of EFP vessels, Krishnamoorthi (1978) has observed a decline in the total catch of catfish along the Andhra-Orissa coast during 1966-76, and has cautioned for a proper management policy against a possible danger of depletion by overfishing.

The statewide catfish landings for the subsequent period, from 1977 to 1982, compiled by the present authors, are given in Table 1. From this table it may be seen that in W. Bengal the catfish landings increased from 134 tonnes in 1977 to 9,075 tonnes in 1982. In Orissa, though there had been an increase in the landings from 1,035 tonnes in 1977 to 6,084 tonnes in 1981, the catch declined to 3,993 tonnes in 1982. In Andhra Pradesh, on the other hand, the landings, though considerably fluctuated, had a general declining trend. In Tamilnadu also the landings declined, from 15,205 tonnes in 1977 to 3,792 tonnes in 1981, but increased to 6,048 tonnes in 1982. In Kerala the landings increased from 7,949 tonnes in 1977 to

13,936 tonnes in 1980, and subsequently declined to 9,532 tonnes in 1982. In Goa the catch trend was similar to that of Orissa, with fluctuations, but with a general decreasing trend. In Karnataka, Maharashtra and Gujarat the catch fluctuated, but with a general increasing trend.

The statewide percentage contribution to the all-India catfish landings (average for 1977-82) are given in Fig. 1. The percentages varied from 2.7% to 19.7%, with Kerala topping the list. The order of contribution was Kerala, Maharashtra, Gujarat, Karnataka, Tamilnadu, Andhra Pradesh, Orissa, West Bengal and Goa.

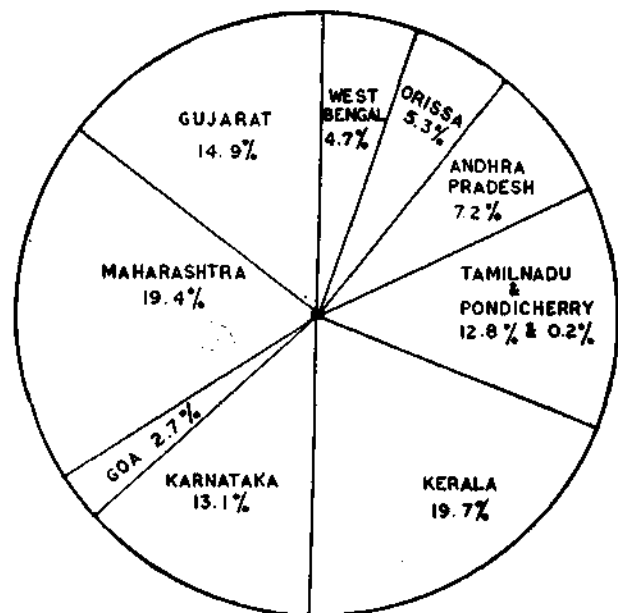


Fig. 1 State-wise percentage composition of catfish landings (Average for the year 1977-1982).

Andhra Pradesh, Orissa, West Bengal and Goa. However, this contribution does not necessarily reflect the true picture of abundance of the resource, as the contribution depends as much on the length of the exploitable coast and the effort expended as on the availability

TABLE 1

*State-wise Catfish Landings in Tonnes and %age Composition in All Fish During 1977-1982*

	West Bengal	Orissa	Andhra Pradesh	Tamil Nadu	Pondicherry	Kerala	Karnataka	Goa	Maharashtra	Gujarat	Andamans	Lakshadweep	Total
<b>1977</b>													
Catfish	134	1035	5662	15205	137	7947	5162	918	8318	8958	28	—	53504
All fish	6689	15072	100756	206046	6462	345037	97152	24731	264452	189638	1532	2215	1259782
%	2.00	6.87	5.62	7.38	2.12	2.30	5.31	3.71	3.14	4.72	1.83	0	4.25
<b>1978</b>													
Catfish	151	1794	3281	5252	168	9125	2831	1356	11081	4159	33	—	39231
All fish	12754	139670	82116	212899	6828	373339	152860	27111	284244	201929	7077	2780	1403607
%	1.18	1.28	3.99	2.47	2.46	2.44	1.85	5.00	3.90	2.06	0.47	0	2.79
<b>1979</b>													
Catfish	140	1308	3799	5617	51	11328	9920	846	10433	5320	55	—	48817
All fish	10744	51808	91426	235008	10068	350509	126384	25388	293326	191312	1721	3846	1388380
%	1.30	2.52	4.15	2.39	0.51	3.43	7.85	3.33	3.56	3.78	3.20	0	3.52
<b>1980</b>													
Catfish	723	2198	2338	4047	78	13936	5354	1151	8653	5235	32	—	43745
All fish	6097	39375	116013	217394	9390	279543	115322	24490	231763	203494	1803	2909	1249837
%	11.86	5.58	2.05	1.86	0.83	4.98	4.64	4.70	3.73	3.57	1.77	0	3.50
<b>1981</b>													
Catfish	4449	6084	4250	3792	102	9562	7503	2211	11045	10370	22	—	59390
All fish	20107	35655	116143	221296	10755	274395	153349	34498	272587	234510	1862	3300	1378457
%	22.13	17.06	3.66	1.71	0.95	3.48	4.89	6.41	4.05	4.42	1.18	0	4.31
<b>1982</b>													
Catfish	9075	3995	3182	6048	20	9532	10253	1541	10919	12662	37	—	67664
All fish	27649	33557	118034	245961	12058	325795	154836	34041	253429	207204	3859	4201	1420624
%	32.82	11.91	2.69	2.46	0.16	2.92	6.62	5.70	4.31	6.11	0.96	0	4.76

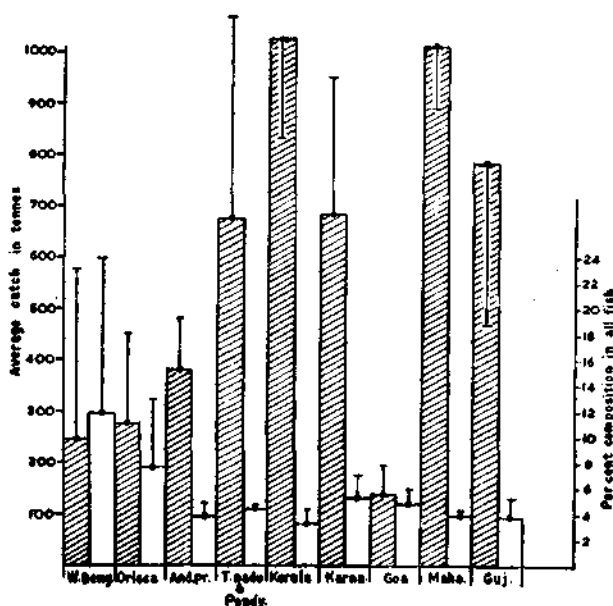


Fig. 2 State-wise average catch of catfish during 1977-1982 and percentage composition of catfish in all fish with one SD.

of resource. The statewide average catches of catfish during 1977-82 and their percentages in the all-fish catches of the respective states, which might give a clearer picture, are given in Fig. 2. Though there were good catfish landings in Kerala, Maharashtra, Gujarat and Tamilnadu, their percentages in the all-fish catches of the respective states were not as high as those in West Bengal, Orissa, Karnataka and Goa. The low percentages of catfish in the all-fish catches in Kerala, Maharashtra and Gujarat were apparently due to the more flourishing mackerel and oil sardine fisheries in Kerala and bombayduck in Maharashtra and Gujarat.

#### Centrewise Catch and Effort Trends

As centrewise catch and effort data are more pertinent for drawing any inference on the resource distribution, attempts are made to consider the above parameters separately for each centre. This would also help to segregate

different populations, if any, at different centres. The centres where there are fullfledged fishing activities and where catfishes are a regular component in the fishery are chosen. The catfishes are mostly caught as a by-catch in trawl net. They are also caught considerably by drift gill net, hooks & line and purseseine from all along the coast. The catch per unit effort is used as the measure of abundance of the fish though it can be affected by the availability and vulnerability of the fish to the gear concerned. The catch and effort distribution at different centres are given below.

**Waltair :** The study is based on the data of the survey operations conducted by the Exploratory Fisheries Project (EFP) and of the commercial trawlers based at Waltair during 1970-82.

The EFP vessels *M. V. Meena Shodhak* and *M. V. Meena Jawahar*, both 17.5 m 200HP stern steel trawlers, fished, operating 24 m trawl net, during the period 1975-80. The data of *M. V. Matsya Shikari* (39.8m, 1740 HP), which had done survey in 1980-82 with 34 m and 44.8m, bottom trawls, and of *M. V. Matsya Darshini*, which had operated purseseine (Length 221.5m, depth 50 m and mesh size 18.4 mm) during 1981, were also available. The catfish species landed by these vessels were *Tachysurus thalassinus* and *T. tenuispinis*, the former dominating in the catch. The catch per hour of trawling (CPUE) of *M. V. Meena Shodhak* and *M. V. Meena Jawahar* are shown in Fig. 3. The catch rates were fairly good in all the months except June, July and August, indicating good abundance of this resource in this region. The quarterwise data for 1978-79, given in fig. 4, show that the catfish concentrations were high during the first two quarters. The CPUE data for 1980-82 for the EFP vessels (Fig. 5) show a similar trend all along the northeast coast.

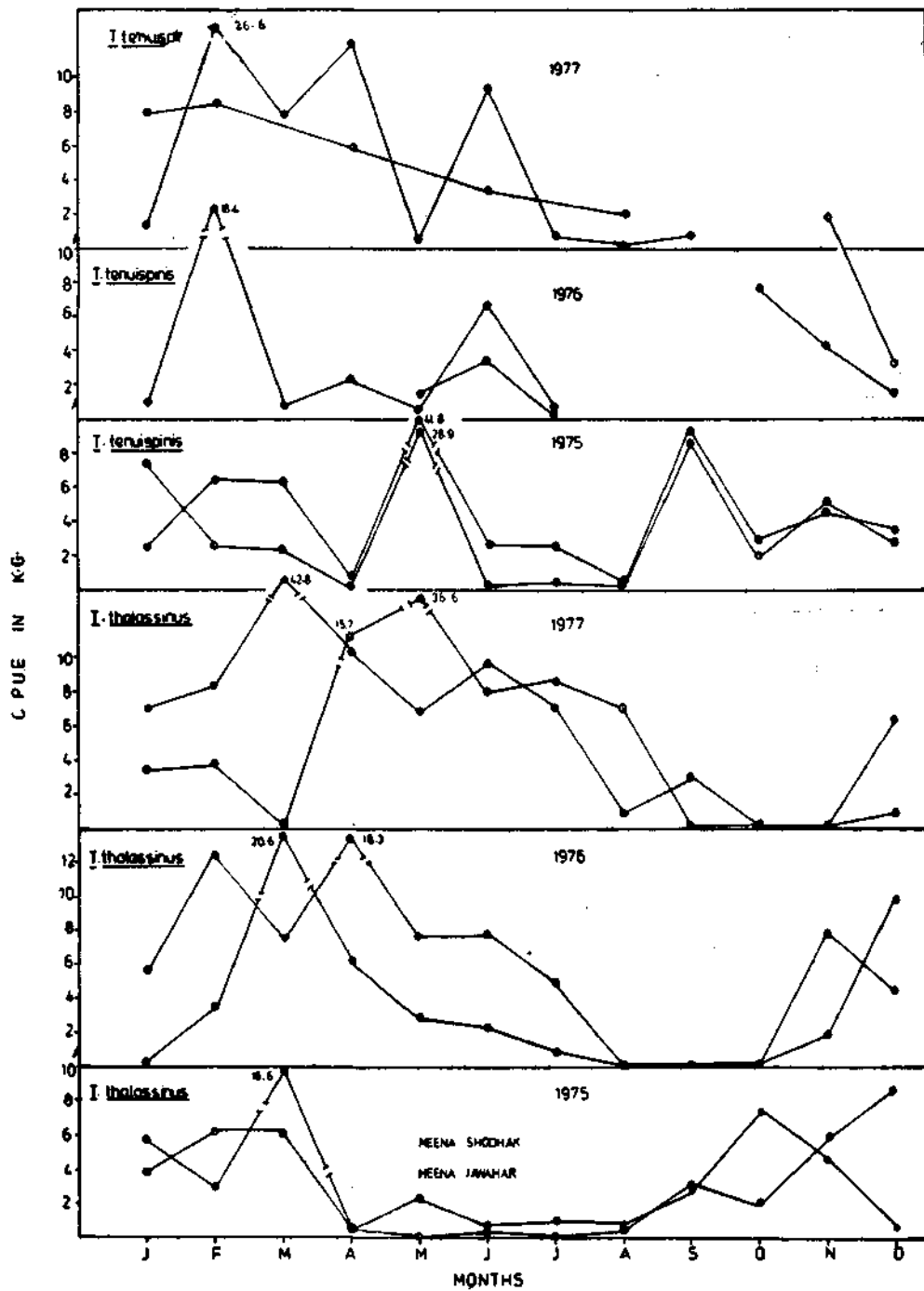


Fig. 3 Catch per unit effort of *T. tenuispinis* by EFP vessels, M. V. Meena Shodhak and M. V. Meena Jawahar at Waltair during 1975-77.

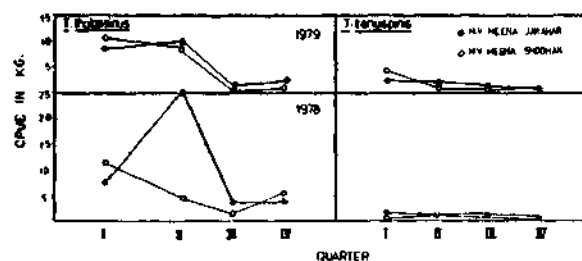


Fig. 4 Quarter-wise catch per unit effort of *T. tenuispinis* and *T. thalassinus* by EFP vessels, M. V. Meena Shodhak and M. V. Meena Jawahar at Waltair during 1978-79

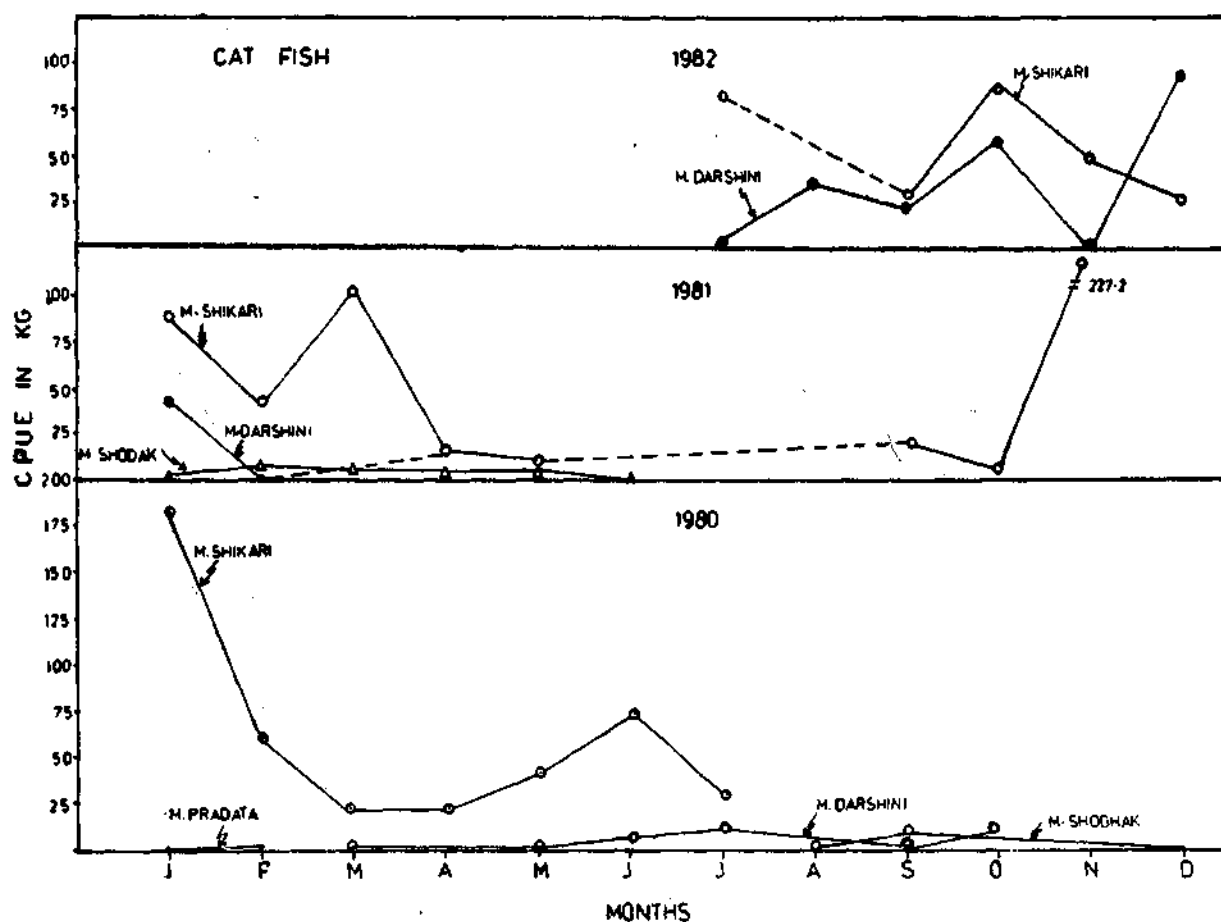


Fig. 5 Catch per unit effort of all catfish landed by EFP Vessels, M. V. Meena Shodhak, Meena Jawahar, M. V. Mateya Shikari, M. V. Mateya Darshini and M. V. Meena Pradeta during 1980-1982 at Waltair.

The details of the commercial trawl operations off Visakhapatnam during 1979-82 are given in Table 2. The catfish landings varied from 150 tonnes (2.5% in total fish catch) in 1981 to 375 tonnes (6.3% in total fish catch) in 1979. There was a steady decline of effort from 38,109 units in 1979 to 28,557 units in 1982. The annual catch rate of catfish also declined, from 9.86 kg in 1979 to 4.73 kg in 1981, however with a slight increase to 7.6 kg in 1982. The analysis of catch rate does not reveal any definite monthly trend in abundance. The operational details of bottom-set gill nets by catamarans at Visakhapatnam during 1972-82 are given in Table 3. The catfish formed, on an average, 15% of the annual all-fish catch by bottom-set gill net. The effort expended steadily increased from 1,083 units in 1975 to 10,373 units in 1978, but the catfish landings varied from 3.6 tonnes in 1979 to 34.5 tonnes in 1981 without any definite trend. The catch rate fluctuated between 0.46 kg in 1982 and 6.73 kg in 1981, with an average of 2.4 kg. *T. tenuispinis* was the most dominant species (72%), followed by *T. Thalassinus* (28%). The details of hook & line operations by catamarans are shown in Table 4. Catfish landings by this gear varied from 13 tonnes in 1970 to 50.3 tonnes in 1982, showing an annual average of 9.8% in the all-fish total catch. Though the catch fluctuated from year to year, the catch rate remained almost constant throughout the period of study with an average of 0.84 kg. In contrast to the bottom-set gill net, the hook & line landed more *T. thalassinus* (80.6%) than *T. tenuispinis* (19.4%).

**Mandapam :** The catch-and-effort data of the commercial trawl operations for the period 1971-76 are used for this study. The month-wise catfish landings and the composition of *T. thalassinus* during this period are given in Table 5. The landings as well as the catch rate were good during the 2nd and 3rd quarters. In the trawl nets *T. thalassinus* (50%) was the common species caught, followed by *T. dussumieri*, *T. Platystomus* and *T. serratus* (Table 6, 7 and 8).

**Cochin :** The details of the operations by commercial trawlers off cochin are given in

Table 9. Here the catfish catch fluctuated between 74 tonnes in 1979 and 332 tonnes in 1980, with an average of 235 tonnes. April-June was the peak period of abundance for catfishes at Cochin. The catch rate showed fluctuations between months with high values during April-June period (Table 9). The catch rate of 1.7 kg of 1979 increased to 7.2 kg in 1980 and continued without much variation in 1981 and 1982. The details of the drift gillnet operations at Cochin during 1979-82 are presented in Table 10. Catfishes formed about 17% of the total drift-net landings. The catch varied from 380 tonnes in 1980 to 1118 tonnes in 1979 with catch rates of 9.4 kg and 30.2 kg respectively. July to October was the peak period of occurrence, with a high catch rate. This is a clear indication that there is a good catfish resource along the coastal waters during the monsoon and post monsoon months, probably owing to shoreward migrations for feeding/spawning. This resource, which had not been properly exploited either by the trawlers or by the indigenous gear, has assumed importance with the introduction of purse seiners in late seventies. Though catfishes are bottom dwellers during part of their life, they move along both column and surface waters in large shoals and become vulnerable to purse seiners. The details of monthwise operations of purse seiners based at Cochin Fisheries Harbour during 1979-82 are shown in Table 11. The average monthly total catch varied from 1.5 tonnes in March to 32.5 tonnes in September. The bulk of the catch was in September in all the years. The catch rate shows a trend that is increasing from 1979 to 1981 and then declining in 1982.

**Calicut :** Specisewise catfish landings of trawl nets during 1979, 1981 and 1982 at Calicut are given in Table 12, which shows that the abundance of catfishes as indicated by the catch rate was good in 1979 but progressively declined in 1981 and 1982. The dominant species in the trawl catch were *T. tenuispinis* (78-100%) and *T. dussumieri* (22%). Catfishes were caught along Calicut by drift gill net and hook & line, of which the specieswise catches and catch rates are shown in Table 13

and 14 respectively. Drift-net catches showed a decline similar to that of trawl net, from 169 tonnes in 1979 to 46 tonnes in 1982, with the catch rate declining from 49 kg in 1979 to 20.5 kg in 1982. All the years *T. dussumieri* was the most abundant species (53-61%), followed by *T. tenuispinis* (15-30%) and *T. serratus* (11-22%). The first and third quarters were the peak periods of landings. As regards the resource abundance, it was almost uniformly distributed off Calicut throughout the year with peak during August-October period. Hooks & line was the most effective gear. Since different sizes of hooks were used in different branch lines, on a main line, the size selection by this gear was minimised, and all the age groups available in the area were represented in the catch. During the period the hooks & lines landed, on an average, 301 tonnes of catch annually. The total catch remained almost constant throughout. The catch rate also showed little variation between months and years, indicating the continuous abundance of this resource off Calicut. *T. tenuispinis* occurred in high percentages (30-70%), followed by *T. dussumieri* (15-42%), *T. thalassinus* (9-26%) and *T. serratus* (1.4-3.2%). Hooks and line is a gear very effective in the conservation of this resource inasmuch as gestating males and ripe females are never caught by it.

**Mangalore:** Though there were regular trawl operations in 1979-82, except during the SW monsoon period, along the South Karnataka coast; only in January 1981 about 36 tonnes of catfish were landed, with a catch rate of 3.24 kg per hour of trawling. The traditional drift gill nets operating during the same period, however, landed catfish all through, without much variation (Table 15). The catch by this gear fluctuated from 226 tonnes in 1979 to 489 tonnes in 1980. Annual catch rate has not shown wide fluctuations, except for a slight decline from 1980 onwards. The data on purseseine operations with regard to all-fish total and catfish landings at Mangalore

during 1979-82 period are shown in Table 16. Catfish catch by purseseines were in an increasing trend from 1980 to 1982, forming 3.6% to 9.4% of total purseseine catch. September to January was the peak period of abundance along the South Karnataka coast. The catch rate of 220 kg in 1979 declined to 89 kg in 1980, but revived to 202 kg in 1982. The introduction of purse-seine in the South Karnataka had a perceptible influence on the fishery of the region, particularly that of the catfish. The catfish landings increased from an hitherto annual average of 4,000 tonnes to 10,250 tonnes in 1982, creating a need for a continuous monitoring of the fishery in order to ensure a rational exploitation of the stock, especially in view of the large-scale destruction of spawners and gestating males.

**Bombay:** The bottom-trawl operations of the EEP vessels based at Bombay gave only a discontinuous picture of the catfish resource. However, on the available information on catch rates, the catfishes appear to be abundant althrough except during the SW monsoon. These vessels also had operated purse-seines for a very short period, September-October 1981; of which the landings particulars are illustrated in Fig. 6.

The data on trawl operations (for the period 1980-82) collected at New Ferry Wharf (Table 17), a fishing harbour that has been established recently to accomodate the fishermen coming from Gujarat, indicate that there was a regular increase in the trawling effort from 9,575 units in 1980 to 21,302 units in 1982. There was also a corresponding increase in the total all-fish landings, from 12,070 tonnes to 31,182 tonnes. The catfish landings, too, showed a promising increase, from 240 tonnes to 1,221 tonnes. The catch rates of catfish were between 25 kg and 57 kg, showing an increasing trend from 1980 onwards. The peak landings were during the first and last quarters.



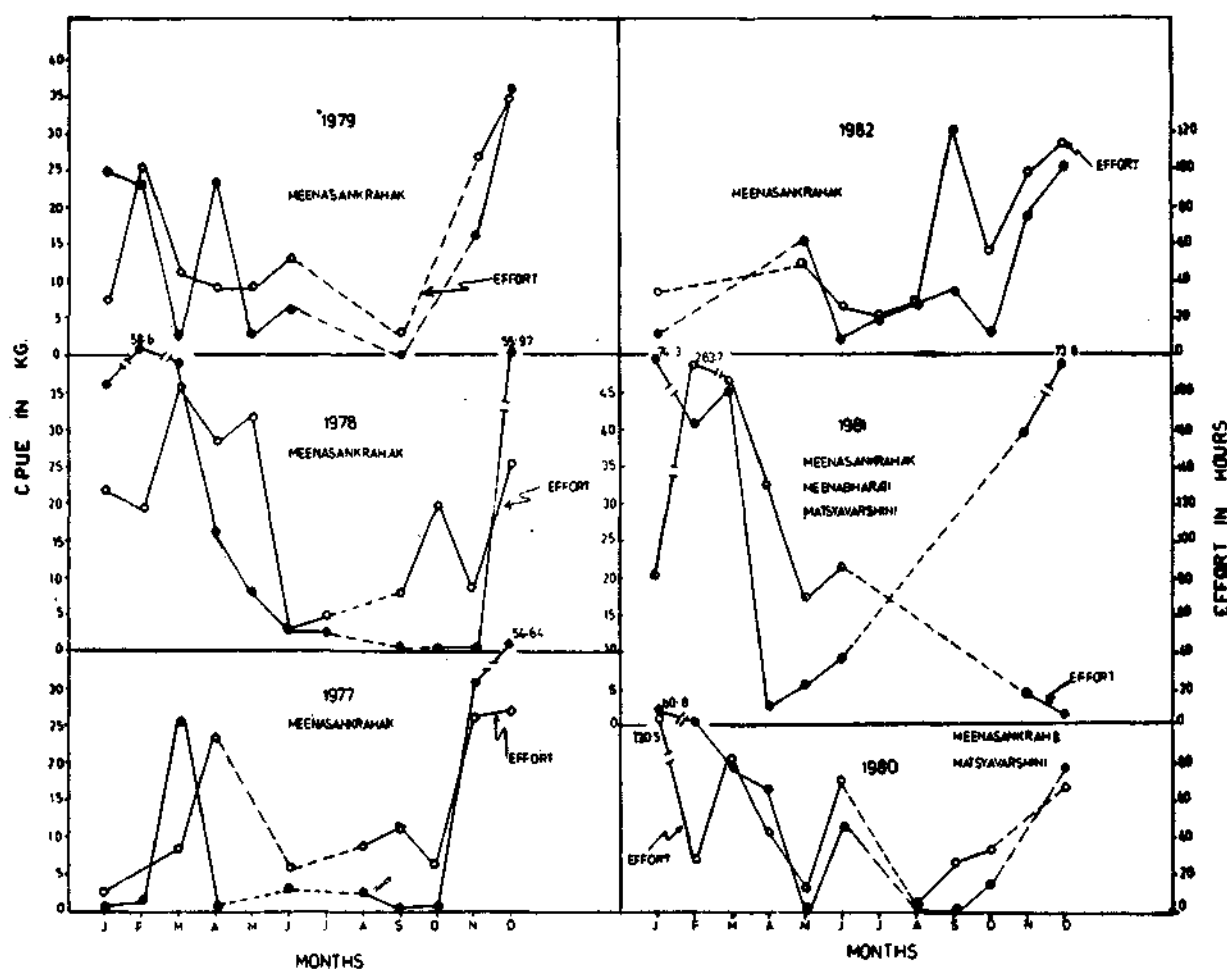


Fig. 6 Catch per unit effort (Bottom trawl) of all catfish landed by EFP Vessels, M. V. Meena Sangrahaak, 1977-1982, Meena Bharati, 1981 and Matsya Varshini, 1980-1981 at Bombay.

The details of the catfish landings by trawlers at Sassoon Dock during 1979-82 are shown in Table 18. From the data it is seen that the catfish catches fluctuated during the years, however, with an improving general trend. The catch rates, though with fluctuations, remained fairly high all through the period, except during the SE monsoon, when the population presumably migrates southward. The gill-net operations during 1979-81, however, showed a different picture. The catches were very poor, except in the year 1982 (Table 19). The catch rates during 1979-81 period, too, were extremely low (0.22 kg to 1.5 kg); in 1982, however, coinciding with the total catch, the catch rates rose to 62.2 kg. This is also true in

the case of 'Dol' net operations during 1979-82 (Table 20). The very low percentage of catfish in 'Dol' net landings in general may be due to the agility of catfish to avoid this passive gear.

The details of the hooks & line catches and catch rates for the years 1979-82 observed at the Sassoon Dock are shown in Table 21. The catfishes formed 50 to 70% of the total catches of this gear, probably on account of the scavenging nature of the fish. The annual trends of both the total catch and the catch rate were slightly increasing over the years, but the monthly trend of catch rate was more or less uniform.

TABLE 2

*Details of Landings (All Fish and Catfish) by Private Trawlers in Tonnes at Visakhapatnam During 1979-1982*

	January	February	March	April	May	June	July	August	September	October	November	December	Total
<b>1979</b>													
All fish	698	428	313	393	485	401	619	544	321	602	569	559	5912
Catfish	62	79	2	75	29	6	3	22	12	18	9	58	375
% of cat fish	8.88	18.5	0.6	19.1	6.0	1.5	0.5	4.0	3.7	3.0	1.6	10.4	6.3
Effort in units	2680	2546	2093	2585	2724	2805	4492	3839	4003	3033	3349	3870	38019
CPUE of Cat-fish (Kg)	23.1	31.0	0.96	29.0	10.65	2.14	0.67	5.73	3.00	5.93	2.69	14.99	9.86
<b>1980</b>													
All fish													
Catfish	312	820	811	751	1043	370	618	975	732	679	506	434	8051
% of Catfish	40	83	16	0	0	0	2	1	23	14	3	15	197
Effort units	12.82	10.12	1.97	0	0	0	0.32	0.10	3.14	2.06	0.59	3.46	2.45
CPUE of Cat-fish (kg)	2800	4087	2568	1579	2186	2276	3423	4699	3389	3086	2794	2519	35406
	14.28	20.31	6.23	0	0	0	0.59	0.21	6.79	4.54	1.07	5.95	5.56
<b>1981</b>													
All fish	538	878	452	107	293	664	486	755	529	484	486	434	6106
Catfish	25	12	7	2	26	19	20	2	11	13	10	3	150
% of catfish	4.65	1.37	1.55	1.87	8.87	2.86	4.11	0.26	2.08	2.68	2.06	0.69	2.46
Efforts units	3679	3200	2604	746	1566	3275	2776	4692	3206	2164	2010	1717	31635
CPUE in kg	6.79	3.75	2.69	2.68	16.60	5.80	7.20	0.43	3.43	6.01	4.97	1.75	4.73
<b>1982</b>													
All fish	354	922	397	213	269	303	575	853	924	313	690	435	6248
Cat fish	16	19	16	8	5	7	19	34	36	7	28	22	217
% of cat fish	4.52	2.06	4.03	3.75	1.86	2.31	3.30	3.98	3.90	2.24	4.06	5.06	3.47
Effort units	1622	2125	1449	1280	2687	2696	2934	3734	4164	1887	2174	1805	28557
CPUE of Cat fish (Kg)	9.86	8.84	11.04	6.25	1.86	2.60	6.47	9.10	8.64	3.71	12.88	12.19	7.60

TABLE 3

*Effort (units) expended, catfish catches in (kgs) C/U, % in all-fish and specise-wise distribution with their percentage occurrence in total catfish catches and Lawson's Bay.*

*(Unit : Catamaran; Gear : Bottom set gill net; Place : Visakhapatnam; Period : 1972-to 1982)*

Particulars	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	All years Total
Effort (units)	8259	8936	3825	4349	1083	4510	10373	5200		5126	8695	60386
Catfish catch (in kg)	19,722	33,536	5,452	18,953	4,674	15,503	4,769	3,582		34,492	4,020	144,693
C/U	2.39	3.75	1.42	4.36	4.32	3.44	0.64	0.69		6.73	0.46	2.40
% in all fish	12.34	20.86	10.80	17.20	18.53	15.64	5.67	10.05		35.14	3.28	14.99
<i>T. thalassinus</i>	6142	7798	2213	9164	2352	4271	1976	1196		2534	2797	40443
% in catfish	31.14	23.25	40.59	48.38	50.32	27.55	41.43	33.39		7.35	69.58	27.95
<i>T. tenuispinis</i>	13580	25738	3239	9779	2322	11232	2793	2386		31958	1223	104250
% in catfish	68.86	76.75	59.41	51.62	49.68	72.45	58.57	66.61		92.65	30.42	72.05

TABLE 4

*Effort (Units) expended, catfish catches in kg, C/U, % in all-fish and speciesewise catches with their percentage occurrence in total catfish catches at Lawson's Bay, Visakhapatnam during 1970-1982.*

Uuits : Catamaran					Gear: Hooks & Line.									
Particulars	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	All years total
Effort (units)	37600	37646	37212	27785	35100	28960	29023	32201	31497	41248	27090	36628	37479	440469
Catfish catch (kg)	12960	33357	25789	28344	20576	14301	22029	46627	25531	53123	16498	22074	50301	371519
C/U	0.34	0.89	0.69	1.02	0.59	0.48	0.76	1.45	0.81	1.29	0.61	0.60	1.34	0.84
% in all fish	3.20	10.09	8.04	11.20	6.46	6.23	8.93	17.27	7.01	15.67	9.65	10.21	15.60	9.81
<i>T. thalassinus</i>	12484	26149	22690	19453	18862	10263	12263	40724	13324	37386	16423	21322	48264	299609
% in catfish	96.26	78.39	87.98	68.63	91.67	71.76	55.68	87.34	52.19	70.38	99.54	96.59	95.95	80.64
<i>T. tenuispinis</i>	485	7208	3099	8891	1714	4038	9764	5903	12207	15737	75	752	2037	91910
% in Catfish	3.74	21.61	12.02	31.37	8.33	28.24	44.32	12.66	47.81	29.62	0.45	3.41	4.05	19.36

TABLE 5

*Species-wise details of catfish landings (in kg)*

Year : 1971 to 1973

Centre : Mandapam Camp

Gear : Trawl-net

Month	1971				1972				1973			
	<i>T. thala-</i> <i>sinus</i> catch (kg)	Total catfish catch (kg)	Effort (units)	C/E	<i>T. thala-</i> <i>ssinus</i> Catch (kg)	Total Cat- fish catch (kg)	Effort (units)	C/E	<i>T. thala-</i> <i>sinus</i> (kgs)	Total Catfish catch (kg)	Effort (units)	C/E (kg)
Jan	1001	1820	292	6.2	563	1250	495	2.5	2586	4880	1155	4.2
Feb	510	1020	254	4.0	2215	4430	1166	3.8	1877	4170	1118	3.7
Mar	2274	3790	543	7.0	2971	4570	1624	2.8	2938	4520	1488	3.0
Apr	5525	8500	584	14.5	8078	10770	1800	6.0	2170	3100	1044	3.0
May	8162	11660	425	27.4	7917	11310	2141	5.3	3485	4710	2318	2.0
June	13846	13846	1313	15.1	9506	13850	3932	3.5	6270	9220	3034	3.0
July	17256	28760	1268	22.7	4713	7250	2281	3.2	3562	5480	1348	4.1
Aug	10689	15270	1196	12.8	1122	1870	941	2.0	1309	1870	914	2.1
Sep	12181	18740	1018	18.4	1205	2410	802	3.0	866	1925	802	2.4
Oct	4490	8980	485	18.5	2196	6275	1256	5.0	1520	3800	1347	2.8
Nov	725	2070	345	6.0	724	1810	706	2.6	8035	25110	917	27.4
Dec	760	1900	581	3.3	778	2160	838	2.6	567	1350	714	1.9
Total	77419	122290	8304	14.7	41988	67955	17982	3.8	35185	70135	16119	4.3

TABLE 6

*Species-wise catch details of catfish landings (in kg).*

Year : 1974

Centre : Mandapam Camp

Gear : Trawl-net

Month	<i>T. thalasinus</i>	<i>T. dussu- mieri</i>	<i>T. platy- stomus</i>	<i>T. caelatus</i>	<i>T. tenuispinis</i>	<i>T. maculatus</i>	<i>O. mili- taris</i>	Total catfish catch (kg)	Effort (units)	C/E
Jan	1471	1260	248	285	—	—	—	3264	1357	2.4
Feb	1964	1435	460	398	—	—	195	4452	1464	3.0
Mar	6183	3680	674	200	—	250	358	11345	1640	6.9
Apr	540	60	110	62	—	—	—	772	710	1.1
May	610	35	68	—	—	—	—	713	417	1.7
Jun	680	33	123	34	—	—	—	870	600	1.5
Jul	1040	480	284	—	—	—	300	2104	1050	2.0
Aug	1219	985	165	—	—	—	170	2539	978	2.6
Sep	635	1196	113	—	—	—	65	2009	610	3.3
Oct	712	1560	15	—	—	—	—	2287	1100	2.1
Nov	435	945	87	—	—	—	—	1467	640	2.3
Dec	196	649	120	—	73	—	—	1038	375	2.8
Total	15685	12318	2467	179	73	250	1088	32860	10941	3.0

TABLE 7

*Species-wise catch details of catfish Landings (in kg).*

Year : 1975

Centre : Mandapam camp

Gear : Trawl/net

Month	<i>T. thalassinus</i>	<i>T. dussumieri</i>	<i>T. platystomus</i>	<i>T. caelatus</i>	<i>T. tenuispinus</i>	<i>T. maculatus</i>	<i>O. militaris</i>	Total catfish catch	Effort (units)	C/E
Jan	449	246	35	79	70	—	—	879	255	3.5
Feb	1932	1428	126	420	294	—	—	4200	643	6.5
Mar	6495	1990	410	1571	—	—	—	10475	1465	7.2
Apr	7564	1005	431	574	—	1149	718	11441	1185	9.7
May	5365	555	—	1758	—	370	1203	9251	1530	6.1
Jun	7249	735	—	840	—	630	1051	10505	1541	6.8
Jul	4733	444	222	518	296	592	592	7397	1150	6.4
Aug	4046	843	759	1012	674	253	843	8430	1230	6.9
Sep	3032	1410	846	987	282	494	—	7051	1500	4.7
Oct	2014	1802	424	636	318	—	—	5194	775	6.7
Nov	843	—	—	—	—	—	—	842	913	0.9
Dec	1292	—	—	—	—	—	—	1292	781	1.7
Total	45013	10458	3262	8395	1394	3488	4407	76957	12968	5.9
% in total catfish catch	58.5	12.6	4.2	10.9	2.5	4.5	5.7			

TABLE 8

*Species-wise catch (kg) details of catfish landings (in kg).*

Year : 1976

Centre : Mandapam camp

Gear : Trawl/net

Month	<i>T. thalassinus</i>	<i>T. dussumieri</i>	<i>T. platystomus</i>	<i>T. caelatus</i>	<i>T. tenuispinis</i>	<i>T. maculatus</i>	<i>O. militaris</i>	Total catfish catch	Effort (units)	C/E
Jan	8296	4060	1412	2118	1412	353	—	17651	1770	10.0
Feb	6113	3804	1630	1359	679	—	—	13585	1400	9.7
Mar	11223	3290	1355	1548	1355	—	—	18771	1290	14.6
Apr	7988	1550	1311	358	238	—	477	11922	1866	6.4
May	3536	343	—	539	—	196	245	4859	2480	10.0
Jun	3348	594	—	432	—	108	918	5400	2730	10.00
Jul	2142	428	122	184	—	—	184	3060	1800	1.7
Aug	5213	2281	869	1738	326	217	217	10861	2280	4.8
Sep	4036	3080	1274	1168	637	425	—	10620	2840	3.7
Oct	5318	5474	2033	2346	469	—	—	15640	2976	5.3
Nov	4056	2839	1014	710	1521	—	—	10140	2526	4.0
Dec	—	—	—	—	—	—	—	—	—	—
Total	61269	27743	11020	12500	6637	1299	2041	122509	23958	5.1
% in total catfish catch	50.0	22.7	9.0	10.2	5.4	1.1	1.7			



TABLE 9

*Details of operations of trawlers with respect to all-fish and total catfish landings in tonnes at Cochin fishing harbour during 1979-1982.*

1979	Janu- ary	Febru- ary	March	April	May	June	July	August	Sept- ember	Oct- ober	Novem- ber	Decem- ber	Total
All fish	396	433	1035	1057	1557	884	1058	1754	1104	103	687	1324	11392
Catfish	0	0	2	15	8	35	1	0	1	3	9	0	74
% of catfish	0	0	0.19	1.42	0.51	3.96	0.09	0	0.09	2.91	1.31	0	0.65
Effort units	3444	3578	5862	4973	7051	2942	2002	2195	779	476	3140	7383	43825
CPUE (kg) catfish	0	0	0.34	3.02	1.13	11.90	0.50	0	1.28	6.30	2.87	0	1.69
<b>1980</b>													
All fish	804	703	1726	1058	1643	168	171	838	54	14	71	663	7913
Catfish	0	2	95	34	185	0	1	4	2	6	0	3	332
% of catfish	0	0.28	5.50	3.21	11.26	0	0.58	0.48	3.70	42.85	0	0.45	4.20
Effort in units	7278	6067	6679	6400	8800	1175	1148	1814	285	68	638	5744	46096
CPUE (kg) catfish	0	0.33	14.22	5.31	21.02	0	0.87	2.20	7.02	88.23	0	0.52	7.20
<b>1981</b>													
All fish	384	476	431	423	1019	382	1050	1020	1219	0.4	144	513	7160.4
Catfish	1	0	1	5	70	67	74	27	5	0	0	3	253
% of catfish	0.26	0	0.23	1.18	6.88	17.54	7.05	2.65	0.38	0	0	0.58	3.53
Effort unit	4769	5932	5610	4940	6850	2443	3316	1319	1968	4	1984	5182	44317
CPUE of catfish (kg)	0.27	0	0.18	1.01	10.22	27.42	22.32	20.47	2.54	0	0	0.53	5.71
<b>1982</b>													
All fish	304	627	918	664	665	999	816	3279	547	103	450	427	10099
Cat fish	0	2	5	0	10	147	7	50	53	1	6	0	281
% of cat fish	0	0.32	0.54	0	1.04	14.71	0.86	1.52	0.69	0.97	1.33	0	2.78
Effort in units	3187	5152	5020	6465	6751	6004	3126	3752	3440	320	2996	4745	50828
CPUE of cat fish (kg)	0	0.39	1.00	0	1.48	24.48	2.24	13.33	15.41	4.54	2.00	0	5.53

TABLE 10

*Details of gillnet (Drift) operations with respect to total all-fish and catfish landings in tonnes at Cochin during 1979-'82*

	January	February	March	April	May	June	July	August	Sept- ember	October	Nov- ember	Dec- ember	Total
<b>1979</b>													
All fish	151	126	207	147	658	172	838	1051	881	527	130	120	5008
Catfish	4	10	9	1	9	18	120	435	307	188	5	12	1118
% of catfish	2.65	7.94	4.35	0.68	1.37	10.46	14.32	41.38	34.85	35.67	3.85	10.0	22.32
Effort units	2460	2045	3072	6731	3501	1314	3513	2981	3295	3802	2512	1801	37027
CPUE (kg)	1.63	4.89	2.93	0.15	2.57	13.70	34.16	145.92	93.17	49.45	1.99	6.66	30.19
<b>1980</b>													
All fish	118	99	322	65	352	490	286	282	183	142	192	47	2578
Catfish	10	23	54	0	3	9	60	65	64	48	43	2	380
% of catfish	8.47	23.23	16.77	0	0.57	1.84	20.98	23.05	34.97	33.80	23.39	4.2	14.74
Effort in units	1802	1653	2450	1751	3276	2625	2694	2612	2416	1713	16551	928	40471
CPUE (kg)	5.55	13.91	22.04	0	0.61	3.18	22.27	24.88	26.49	28.02	2.60	2.15	9.38
<b>1981</b>													
All fish	103	99	99	267	261	452	286	323	309	101	128	33	2461
Catfish	28	21	28	4	3	38	68	90	54	32	19	4	389
% of catfish	27.18	21.21	28.28	1.50	1.15	8.41	27.78	27.86	17.47	31.68	14.84	12.12	15.81
Effort in units	1607	1251	1444	1382	2712	2576	2844	2572	2327	1225	1247	760	20947
CPUE (kg)	17.42	16.78	19.39	2.99	1.11	14.75	23.91	34.99	23.21	26.12	15.23	5.26	17.72
<b>1982</b>													
All fish	36	121	143	97	205	271	624	300	252	202	43	59	2353
Catfish	1	2	4	1	0	8	109	97	78	38	4	2	344
% of catfish	2.78	1.65	2.79	1.03	0	2.95	17.46	32.33	30.95	18.81	9.30	3.39	14.62
Effort in units	580	1368	1907	1300	2464	2516	3370	2184	2114	1458	693	655	20609
CPUE (kg)	1.72	1.46	2.10	0.77	0	3.18	32.34	44.41	36.90	26.06	5.77	3.05	16.69

TABLE 11

*Details of purse-seine operations with respect to the total all fish and catfish landings in tonnes at Cochin Fisheries Harbour during 1979-1982.*

1979	January	February	March	April	May	June	July	August	September	October	November	December	Total
All fish									126	369	531	7	1841
Catfish									0	4	0	0	4
% of catfish			No operation						0	1.08	0	0	0.22
Effort in units									60	201	279	280	820
CPUE (kg)									0	19.9	0	0	4.88
<b>1980</b>													
All fish	742	762	1035	917	1002	—	—	—	1224	4255	2244	2677	14858
Catfish	0	0	6	0	0	—	—	—	41	0	0	0	47
% of catfish	0	0	0.58	0	0	—	—	—	3.35	0	0	0	0.32
Effort in units	297	382	592	1009	810	—	—	—	1020	2258	1554	1658	9580
CPUE (kg)	0	0	10.13	0	0	—	—	—	40.20	0	0	0	4.91
<b>1981</b>													
All fish	1916	2418	1499	1136	1831	—	—	—	860	3264	3343	1187	17454
Catfish	0	57	0	0	25	—	—	—	52	—	—	—	134
% of catfish	0	2.36	0	0	1.36	0	0	0	6.05	0	0	0	0.77
Effort units	901	810	680	810	844	—	—	—	983	1253	1193	1396	8870
CPUE (kg)	0	70.37	0	0	29.62	0	0	0	52.90	0	0	0	15.11
<b>1982</b>													
All fish	2113	2570	745	898	515	—	—	—	2196	1540	124	588	11289
Catfish	0	0	0	0	33	—	—	—	37	4	0	0	74
% of catfish	0	0	0	0	6.41	0	0	0	1.68	0.26	0	0	0.65
Effort units	1332	1108	625	1291	1145	—	—	—	1108	1140	392	525	8675
CPUE (kg)	0	0	0	0	28.82	0	0	0	33.39	3.48	0	0	8.53

TABLE 12

*Year: 1979 Specieswise catfish catch details at Calicut Gear: Trawl/net*

	T. thalassius	T. dussumieri	T. tenuis	T. serratus	Total	Effort (units)	(CPUE Kg)
Jan	—	600	18134	—	18734	1843	10.2
Feb	—	194	51773	—	51927	1982	26.2
Mar	—	2006	15969	—	17975	1638	11.0
Apr	—	20011	187	62	20260	1297	15.6
May	—	1903	—	—	1903	334	5.7
Jun	—	—	—	—	—	35	0.0
Jul	No operation						
Aug	-do-						
Sep	-do-						
Oct	-do-						
Nov	-do-					7	0.0
Dec	-do-					1234	0.0
Total	—	24714	86023	62	110799	8370	13.2
%	0	22.3	77.6	0.06			
Year: 1981							
Jan	—	—	5222.0	—	5222.0	1335	3.9
Feb	—	—	645.2	—	645.2	536	1.2
Mar	—	—	2660.8	—	2660.8	858	3.1
Apr	—	—	311.5	—	311.5	424	0.7
May	—	—	1732.7	—	1732.7	313	5.5
June to September	No operation.						
Oct	—	—	No catch			195	0.0
Nov	—		-do-			313	0.0
Dec	—	—	821.5	—	821.5	927	0.9
Total	—	—	11393.7	—	11393.7	4901	2.3
%	—	—	100				
Year 1982							
January to October	no data available.						
Nov	—	—	1425.0	—	1425.0	642	2.2
Dec	—	—	170.5	—	170.5	718	0.2
Total	—	—	1595.5	—	1595.5	1360	1.2
%	—	—	100	—			

TABLE 13

Year: 1979 Specieswise catfish catch details at Calicut. Gear: Driftnet

Month	T. thalassius	T. dussumieri	T. tenuispinis	T. serratus	Total	Effort (UNITS)	CPUE
Jan	513	12324	417	1689	14943	506	29.5
Feb	240	29365	1096	1239	31940	554	56.6
Mar	—	4893	—	484	5377	223	24.1
Apr	—	477	—	—	477	25	19.1
May	170	312	—	1282	1764	68	25.9
Jun	230	34	—	204	468	19	24.6
Jul	No catch						
Aug	1737	5192	1073	1446	9448	151	62.6
Sep	11340	11471	29077	802	52690	387	130.2
Oct	3526	15861	6001	7383	32771	493	66.5
Nov	39	1334	36	2183	3592	334	10.8
Dec	—	12328	891	2291	15510	691	22.5
Total	17795	93591	38591	19003	168980	3462	48.8
%	10.5	55.4	22.8	11.3			

Year: 1981

Jan	—	23097.1	555.9	3748.9	27401.9	673	40.7
Feb	—	2807.0	317.8	—	3124.8	386	8.1
Mar	—	2620.0	166.1	—	2786.1	271	10.3
Apr	—	1493.2	—	121.2	1614.3	190	8.5
May	—	1706.3	155.0	117.5	1978.8	189	10.5
Jun	—	315.0	—	240.0	555.0	19	29.2
Jul	—	543.5	22.0	146.3	711.8	114	6.2
Aug	—	2320.5	941.5	1211.9	4473.9	173	25.9
Sep	168.4	12162.5	12630.7	3747.6	29709.2	453	65.6
Oct	524.0	9086.0	2350.8	3144.9	15105.7	471	32.1
Nov	74.7	6975.5	26.7	8719.6	15796.5	597	26.5
Dec	18.3	4326.1	67.8	3759.0	8171.2	634	12.9
Total	785.4	68452.6	17234.3	24956.9	111629.2	4170	26.8
%	0.7	61.3	15.4	22.4			

Year: 1982

January to June No data available.

Jul	—	—	—	260.0	260.0	161	16.3
Aug	100.4	2100.0	3100.0	1029.0	6329.4	231	27.4
Sep	192.0	3869.0	10181.0	4152.0	18394.0	269	68.4
Oct	—	5080.6	282.4	1503.5	6866.5	676	10.2
Nov	—	2113.4	1030.0	643.8	2060.2	394	7.3
Dec	—	10899.5	65.9	186.0	11151.4	647	17.2
Total	292.4	24062.5	13732.3	7774.3	45861.5	2233	20.5
%	0.6	52.5	29.9	17.0			

TABLE 14

Year : 1979 Specieswise catfish catch particulars at Calicut

Gear : Hook &amp; line

Month	T. thalassinus	T. dussumieri	T. tenuispinis	T. serratus	Total	Effort (units)	CPUE
Jan	2902	9347	6442	72	18763	182	103.1
Feb	807	6582	6211	—	13600	94	144.7
Mar	501	27755	1124	—	29380	144	204.0
Apr	706	19035	—	—	19741	145	136.1
May	16866	14486	—	75	31427	242	129.9
Jun	240	1896	—	8055	10191	93	109.6
Jul	—	18	—	81	99	16	6.2
Aug	7634	6632	2341	1034	17641	99	178.2
Sep	35517	9024	30351	1114	76006	293	259.4
Oct	21387	11456	20358	388	53589	277	193.5
Nov	1183	10565	3238	45	15031	96	156.6
Dec	1032	26316	31335	88	58771	366	160.6
Total	88775	143112	101400	10952	344239	2047	168.2
%	25.8	41.6	29.5	3.2			
Year : 1981							
Jan	1741.1	8819.5	21222.7	—	31783.3	167	190.3
Feb	—	35037.3	22110.6	186.7	57334.6	299	191.8
Mar	—	12592.7	9006.8	138.7	21738.2	173	125.7
Apr	27.7	10443.5	1802.3	—	12273.5	103	119.2
May	—	10643.5	—	558.7	11201.9	104	107.7
Jun	—	274.0	—	342.5	616.5	26	23.7
Jul	517.5	502.5	—	136.5	1156.5	25	46.3
Aug	264.0	828.3	5775.0	—	6867.3	51	134.7
Sep	8603.0	4907.3	62397.3	197.1	7610.47	284	267.97
Oct	2490.4	2615.1	41559.4	—	46664.9	243	192.0
Nov	19833.6	9837.0	23171.9	1585.9	54428.4	306	177.9
Dec	9538.7	4981.2	13462.0	1742.3	29724.2	285	104.3
Total	143016.0	101484.6	200504.0	4888.4	349893.0	2066	169.36
%	12.3	29.0	57.3	1.4			
Year : 1982							
January to June No data available							
Jul	—	—	—	4768.5	4768.5	81	58.9
Aug	2022.0	9400.4	16000.0	—	27422.4	197	139.2
Sep	5764.0	15268.0	56748.0	540.0	78320.0	404	193.9
Oct	—	93.3	53222.8	—	53316.1	334	159.6
Nov	12596.6	892.1	16080.3	322.0	29891.0	232	128.8
Dec	—	7138.4	15207.4	—	22345.8	162	137.9
Total	20382.6	32792.2	157258.5	5630.5	210063.8	1410	153.3
%	9.4	15.2	72.8	2.6			

TABLE 15

*Details of drift gillnet operations in respect of total all fish and catfish landings along the South Kanara coast during 1979-1982.*

	Janu- ary	Febru- ary	March	April	May	June	July	August	Sept- ember	October	Nove- mber	Dece- mber	Total
<b>1979</b>													
All fish									112.6	393.9	320.9	452.8	1280.2
Catfish % of catfish Effort									24.4	149.7	25.1	26.9	226.1
in units				-No data-					21.7	38.1	7.8	5.9	17.7
CPUE (kg)									420	4103	4041	4200	226080
									58.1	36.5	6.2	6.4	17.7
<b>1980</b>													
All fish	400.6	210.8	180.4	—	No fishing operation			—	338.8	736.0	409.2	489.9	2760.7
Catfish	74.8	36.0	41.3			—			58.6	96.5	52.4	129.7	489.3
% of catfish	18.7	17.1	22.9			—			17.6	13.1	12.8	26.5	17.7
Effort in units	4484	3968	2592			—			2860	6339	5729	6375	26609
CPUE (kg)	16.7	9.1	15.9			—			20.5	15.2	9.2	20.3	18.4
<b>1981</b>													
All fish	505.9	207.4	148.9	30.7	No fishing operation			—	57.9	593.4	606.1	365.6	2515.9
Catfish	188.8	39.9	18.1	4.9		—			20.5	44.7	83.5	67.4	467.8
% of catfish	37.3	19.2	12.2	15.8		—			35.4	7.5	13.8	18.4	18.6
Effort in units	6646	4200	1985	360		—			994	5892	7307	7054	34438
CPUE (kg)	28.4	9.5	9.1	13.5		—			20.6	7.6	11.4	9.6	12.6
<b>1982</b>													
All fish	378.6	152.2	29.0	—	No fishing operation			—	388.4	612.9	479.0	441.4	2481.5
Catfish	96.3	48.8	13.5			—			50.3	85.0	25.5	49.2	366.6
% of catfish	25.4	30.8	46.7			—			13.0	13.9	5.3	11.2	14.8
Effort in units	7876	4150	1475			—			2365	7211	6287	6832	36196
CPUE in kg	12.2	11.3	9.2			—			21.3	11.8	4.1	7.2	10.1

TABLE 16

*Details of purse-seine operations with respect to total all-fish and catfish landings in tonnes at Mangalore during 1979-1982.*

	Janu- ary	Feb- ruary	March	April	May	June	July	August	Septem- ber	Octo- ber	Novem- ber	Decem- ber	Total
<b>1979</b>													
All fish	2201	2153	3678	4499	1989	1140	—	—	6842	17645	10587	9908	60642
Catfish	24	0	18	413	0	0	—	—	143	166	258	4261	5383
% of catfish	1.09	0	0.49	9.18	0	0	0	0	2.09	0.94	2.44	43.01	8.81
Effort in units	2354	219	2206	2636	170	533	—	—	2717	6311	3612	3268	24026
CPUE in (kg)	10.19	0	8.16	156.68	0	0	0	0	52.63	26.30	71.43	1303.85	219.89
<b>1980</b>													
All fish	6298	3565	2615	3558	1255	—	—	—	13581	13571	14053	7072	65568
Catfish	710	23	204	78	0	0	—	—	560	614	174	9	2372
% of catfish	11.27	0.64	7.80	2.19	—	—	—	—	4.12	4.52	1.24	0.13	3.62
Effort in units	3181	1335	1608	1968	1302	—	—	—	4984	4032	4699	3501	16610
CPUE (kg)	223.20	17.23	126.86	39.63	0	0	0	0	112.36	152.28	37.03	2.57	89.14
<b>1981</b>													
All fish	5157	2352	2655	2560	1000	328	—	—	9874	14217	18176	19972	76309
Catfish	0	26	162	69	0	0	—	—	298	2904	40	1188	4687
% of catfish	0	1.11	6.10	2.69	0	0	0	0	3.02	20.43	0.22	5.95	6.14
Effort in units	5996	4113	4828	4706	3920	1645	—	—	5160	5419	6146	5914	47845
CPUE (kg)	0	6.32	33.55	14.66	0	0	0	0	57.75	535.89	6.51	200.88	97.96
<b>1982</b>													
All fish	12916	4850	3089	4466	6482	—	—	—	11617	14649	6533	1106	65708
Catfish	494	616	138	334	3149	—	—	—	273	1127	11	0	6142
% of catfish	3.82	12.70	4.47	7.48	48.58	0	0	0	2.35	7.69	0.17	0	9.35
Effort in units	4502	1948	1970	2334	3222	—	—	—	5203	6386	575	1202	30342
CPUE (kg)	109.75	316.21	70.05	143.10	977.34	0	0	0	52.47	176.48	3.08	0	202.43



TABLE 17

*Details of operations of trawlers with respect to total all-fish and catfish landings in tonnes at New Ferry Warf (Bombay) during 1980-1982.*

	Janu- ary	Febru- ary	March	April	May	June	July	August	Sept- ember	Oct- ober	Novem- ber	Decem- ber	Total
<b>1980</b>													
All fish	—	—	—	—	—	—	30	78	2561	2982	3143	3276	12070
Catfish	—	—	—	—	—	—	1	4	28	18	133	56	240
% of catfish	—	—	No operation			—	3.33	5.13	1.09	0.60	4.23	1.71	1.09
Effort in units	—	—	—	—	—	—	109	155	2050	2403	2299	2559	9575
CPUE (kg)	—	—	—	—	—	—	9.17	25.81	13.66	7.49	57.85	21.88	25.06
<b>1981</b>													
All fish	2642	2213	2103	3072	1980	66	6	83	1123	2349	2021	2530	20189
Catfish	60	69	68	67	68	3	1	3	50	39	105	86	619
% of catfish	2.27	3.12	3.23	2.18	3.43	4.54	16.67	3.61	4.45	1.66	5.19	3.40	3.07
Effort in units	2196	1925	1988	2667	1972	116	10	111	1549	2220	1870	2346	18970
CPUE (kg)	27.32	35.84	34.20	25.12	34.48	25.86	100.00	27.03	32.28	17.57	56.15	36.66	32.63
<b>1982</b>													
All fish	3129	2197	2066	1986	880	234	32	84	3514	5938	4906	6216	31182
Catfish	152	283	69	76	18	19	3	6	114	185	197	199	1221
% of catfish	4.86	8.33	3.34	3.83	2.04	8.12	9.37	7.14	3.24	3.11	4.01	3.20	3.92
Effort units	2682	2058	2019	2537	1511	278	116	142	2483	2840	1791	2845	21302
CPUE (kg)	56.67	88.92	34.17	29.96	11.91	68.34	25.86	42.25	45.91	65.14	110.00	69.95	57.32

TABLE 18

*Details of operations of trawlers with respect to total all-fish and catfish landings  
in tonnes at Sasoon dock (Bombay) during 1979-1982.*

	January	Feb- ruary	March	April	May	June	July	August	Sept- ember	Oct- ober	Nov- ember	Dec- ember	Total
<b>1979</b>													
All fish	2852	2063	1947	2059	2098	1113	1000	1102	2499	3069	2496	2285	24583
Catfish	214	92	355	121	136	41	64	101	28	138	204	124	1618
% of catfish	7.50	4.46	18.23	5.88	6.44	2.68	6.4	9.16	1.12	4.50	8.17	5.43	6.58
Effort units	3115	2261	2144	2816	2497	1710	1287	1687	2150	2625	2223	2043	26160
CPUE (kg)	68.70	40.69	165.58	42.97	54.76	23.98	47.73	78.35	13.02	52.57	91.77	60.69	61.85
<b>1980</b>													
All fish	2526	1830	1947	1786	1208	430	603	1038	821	1422	2129	2309	18139
Catfish	333	407	442	252	79	34	49	83	69	87	122	127	2084
% of catfish	13.18	22.24	22.70	14.11	6.54	7.91	7.07	8.00	8.40	6.12	5.73	5.50	11.49
Effort units	2076	1755	1834	1930	1958	880	1421	1802	1756	1536	2060	2458	21466
CPUE (kg)	160.41	231.91	241.00	130.57	40.35	38.64	34.48	46.05	39.29	56.64	59.22	51.67	97.08
<b>1981</b>													
All fish	1714	1330	1764	1758	1498	1372	552	1062	1205	2581	1912	2839	19587
Catfish	124	102	251	184	170	134	47	89	94	208	155	164	1722
% of catfish	7.23	7.67	14.23	10.47	11.35	9.77	8.51	8.38	7.80	8.06	8.11	5.78	8.79
Effort units	1953	1810	1703	1748	2009	1805	1010	1853	1666	2222	1605	2147	21540
CPUE (kg)	63.49	56.39	147.39	105.26	84.62	74.24	46.12	48.03	56.42	93.61	96.57	76.38	79.94
<b>1982</b>													
All fish	2066	3356	2315	2817	3131	1934	2970	2860	4250	4302	3000	3890	36891
Cat fish	191	403	27	404	380	134	175	171	221	227	181	389	2903
% of catfish	9.24	12.01	1.17	14.34	12.14	6.93	5.89	5.98	5.20	5.28	6.03	10.00	7.87
Effort in units	2221	2633	1792	1960	2195	1522	1977	1784	2380	2391	1400	2565	24810
CPUE (kg)	86.00	153.64	15.07	206.12	173.12	88.04	88.52	95.85	92.86	94.94	129.28	151.66	117.01

TABLE 19

*Details of gillnet operations with respect to total all-fish and catfish landings  
in tonnes at Sasoon dock (Bombay) during 1979-82*

	January	February	March	April	May	June	July	August	Sept.	October	Nov.	Dec.	Total
<b>1979</b>													
All fish	202	71	25	76	49	44	—	31	159	259	121	190	1227
Catfish	5	—	—	1	—	—	—	—	—	—	—	—	6
% of catfish	2.47	0	0	1.31	0	0	0	0	0	0	0	0	0.49
Effort in units	1436	238	48	188	114	125	—	128	657	555	180	338	4017
CPUE (kg)	3.48	0	0	5.30	0	0	0	0	0	0	0	0	1.49
<b>1980</b>													
All fish	179	88	74	64	95	9	0	19	36	125	103	141	933
Catfish	0	0	0	0	0	0	0	0	1	2	0	0	3
% of catfish	0	0	0	0	0	0	0	0	2.78	1.60	0	0	0.32
Effort in units	334	198	224	193	322	33	0	92	240	369	280	360	2465
CPUE (kg)	0	0	0	0	0	0	0	0	4.17	5.42	0	0	1.13
<b>1981</b>													
All fish	154	182	141	80	57	50	0	49	97	371	290	261	1732
Catfish	1	0	0	0	0	0	0	0	0	0	0	0	1
% of catfish	0.65	0	0	0	0	0	0	0	0	0	0	0	0.06
Effort in units	434	536	347	232	279	145	0	141	300	832	725	562	4533
CPUE (kg)	2.30	0	0	0	0	0	0	0	0	0	0	0	0.22
<b>1982</b>													
All fish	278	275	217	260	247	117	0	3	252	288	127	387	2451
Catfish	0	52	27	52	31	14	0	0	19	17	6	30	248
% of catfish	0	18.91	12.44	20.0	12.55	11.97	0	0	7.54	5.90	4.72	7.75	10.12
Effort in units	658	476	372	387	409	206	0	12	380	407	190	492	3989
CPUE (kg)	0	109.24	72.59	134.37	75.79	67.96	0	0	50.00	41.77	31.58	60.97	62.17

TABLE 20

*Details of Dol-net operations with respect to total all-fish and catfish landings in tonnes at Sasoon dock (Bombay) during 1979-1982.*

	January	February	March	April	May	June	July	August	Sept.	October	Nov.	Dec.	Total
<b>1979</b>													
All fish	232	243	144	195	204	116	163	96	303	511	136	52	2405
Catfish	10	—	—	—	—	3	—	—	—	1	—	—	14
% of catfish	4.31	0	0	0	0	2.59	0	0	0	0.20	0	0	0.58
Effort units	716	910	851	1020	1210	795	1634	724	1200	1443	640	434	11577
CPUE (kg)	13.97	0	0	0	0	3.77	0	0	0	0.69	0	0	1.21
<b>1980</b>													
All fish	121	102	54	46	176	83	160	201	231	159	88	146	1567
Catfish	0	0	0	0	0	0	0	1	7	0	0	0	8
% of catfish	0	0	0	0	0	0	0	0.50	3.03	0	0	0	0.51
Effort in units	860	1048	784	670	1156	1088	1437	1518	654	1188	1020	1139	12562
CPUE (kg)	0	0	0	0	0	0	0	0.66	10.70	0	0	0	0.64
<b>1981</b>													
All fish	84	147	101	165	211	197	140	163	184	332	81	120	1925
Catfish	0	0	0	0	0	0	0	0	0	0	4	0.1	4.1
% of catfish	0	0	0	0	0	0	0	0	0	0	4.94	0.08	0.21
Effort in units	818	990	984	1204	1066	1165	1581	1474	1417	1969	475	856	13399
CPUE (kg)	0	0	0	0	0	0	0	0	0	0	8.42	0.12	0.29
<b>1982</b>													
All fish	126	278	229	227	334	159	110	138	211	117	207	125	2261
Catfish	0	0	0	0	0	0	7	0	0	0	0	0	7
% of catfish	0	0	0	0	0	0	6.36	0	0	0	0	0	0.31
Effort in units	1116	869	661	930	1183	718	1139	1232	1426	1021	1130	1094	12519
CPUE (kg)	0	0	0	0	0	0	6.14	0	0	0	0	0	0.56

TABLE 21

*Details of Hooks & line operations with respect to total all-fish and catfish landings at  
Sasoon Dock (Bombay) during 1979-82.*

	January	February	March	April	May	June	July	August	Sept.	October	Nov.	Dec.	Total
<b>1979</b>													
All fish	57	96	21	3	18	—	—	2	3	—	13	47	260
Catfish	45	55	11	1	8	—	—	1	2	—	10	31	164
% of catfish	78.95	57.29	52.38	33.33	44.44	—	—	50.00	66.67	—	76.92	65.96	63.08
Effort units	190	331	58	8	279	—	—	8	13	—	47	131	51065
CPUE (kg)	236.8	166.16	189.6	125.0	28.67	—	—	125.0	153.8	—	212.77	236.6	153.99
<b>1980</b>													
All fish	59	40	14	16	6	1	1	3	0	4	12	29	185
Catfish	36	14	4	7	2	1	1	2	0	4	9	21	101
% of catfish	61.02	35.0	28.57	43.75	33.33	100.00	100.00	66.67	0	100.0	75.00	72.41	54.59
Effort units	190	137	55	73	27	3	10	16	0	24	90	160	785
CPUE (kg)	189.47	102.19	72.73	95.89	74.07	333.3	100.0	125.0	0	166.66	100.0	131.25	128.66
<b>1981</b>													
All fish	56	43	56	24	1	0	0	2	4	34	84	55	359
Catfish	34	32	44	13	17	0	0	1	4	24	62	38	253
% of catfish	60.71	74.42	78.57	54.17	100.0	0	0	50.00	100.00	70.59	73.81	69.09	70.47
Effort in units	362	2220	227	112	7	0	0	14	27	176	315	217	1677
CPUE (kg)	93.92	145.45	193.83	116.07	142.86	0	0	71.43	148.15	136.36	196.83	175.11	150.86
<b>1982</b>													
All fish	146	81	63	39	26	15	10	9	28	31	10	62	520
Catfish	109	47	26	13	9	4	8	7	15	10	7	20	275
% of catfish	74.66	58.02	41.27	33.33	34.61	26.67	80.00	77.77	53.57	32.26	70.00	32.26	52.88
Effort units	524	238	179	124	79	73	86	85	110	137	80	248	1963
CPUE (kg)	208.01	197.48	145.25	104.84	113.92	54.79	93.02	82.35	136.36	72.99	87.5	80.64	140.09

TABLE 22

*Details of operation of private fishing trawlers with respect to total all-fish landings and total catfish landings in tonnes at Veraval during 1980-1982.*

	Janu.	Febr.	March	April	May	June	July	August	Sept.	October	Nov.	Dec.	Total
<b>1980</b>													
All fish	7572	12562	8402	11282	1950	—	—	—	12	2135	5166	2495	51576
Catfish	200	150	28	132	260	—	—	—	—	16	21	—	807
% of catfish	2.64	1.19	0.33	1.17	13.33	—	—	—	0	0.75	0.41	0	1.54
Effort in units	9976	5376	10156	14040	5487	—	—	—	30	2201	9510	8928	65704
CPUE of catfish (kg)	20.05	27.90	2.76	9.40	47.38	—	—	—	0	7.27	2.21	0	12.28
<b>1981</b>													
All fish	7328	6510	3719	5707	5560	0	0	0	1244	1847	7884	6306	46105
Catfish	66	18	0	57	54	0	0	0	5	24	90	121	435
% of catfish	0.90	0.28	0	1.00	0.97	0	0	0	0.40	1.30	1.14	1.92	0.94
Effort units	13516	9296	7006	10260	8496	0	0	0	1200	2400	17550	4619	74343
CPUE of catfish (kg)	4.88	1.94	0	5.55	6.36	0	0	0	4.17	10.00	5.13	26.20	5.85
<b>1982</b>													
All fish	3303	4930	4661	12791	2749	13	0	0	2182	8481	3563	4230	46903
Catfish	92	11	7	193	97	1	0	0	476	192	8	33	1110
% of catfish	2.78	0.22	0.15	1.51	3.53	7.69	0	0	21.81	2.26	0.22	0.78	2.37
Effort in units	5368	8590	7626	12791	6200	30	0	0	4950	13980	7757	9357	76649
CPUE of catfish (kg)	17.14	1.28	0.92	15.09	15.64	33.33	0	0	96.16	13.73	1.53	3.53	14.48



period except during SW monsoon, the catfishes form 0.9 to 2.4% of the total landing. Though the resource was increasing during the years except 1981, there appears to be no definite season for the fishery, as better catches were recorded in different months without any regularity. The catch statistics

of gill nets (Table 23) also showed a similar condition. The all-fish and catfish landings were high in 1980 and 1982. In drift net, too, catfishes occurred almost round the year, except in July and August, with good catch rates.

### SPECIES COMPOSITION

The catfish resource being a multispecies one with regional variations in composition, representative centres from each maritime state have been selected for this study. While few species are commonly available along both the coasts, there are others which are restricted in distribution. As on the information collected from these centres, the species composition in the different regions are discussed below.

**North East Region:** The fishery in the NE region, comprising W. Bengal, Orissa and

Andhra coasts, is mainly supported by two species, namely *T. thalassinus* and *T. tenuispinis*. Other species of commercial importance are *T. dussumieri*, *T. maculatus*, *T. jella*, *T. caelatus* and *Osteogeneiosus militaris*, the last four species being more abundant along the West Bengal and Orissa coasts. Along Andhra coast, *T. thalassinus* and *T. tenuispinis* commonly occur in the trawl catches. At Visakhapatnam *T. thalassinus* and *T. tenuispinis* are the two species contributing considerably, on an average 67.1% and 32.9%, respectively (Table 24, 25 and 26). In the hooks & line landings, too, *T. thalassinus* is dominant; however, the bottom-set gill net showed a different picture, where *T. tenuispinis* is major contributor. On the whole, it may be stated that these two species contribute to the catches along the NE region.

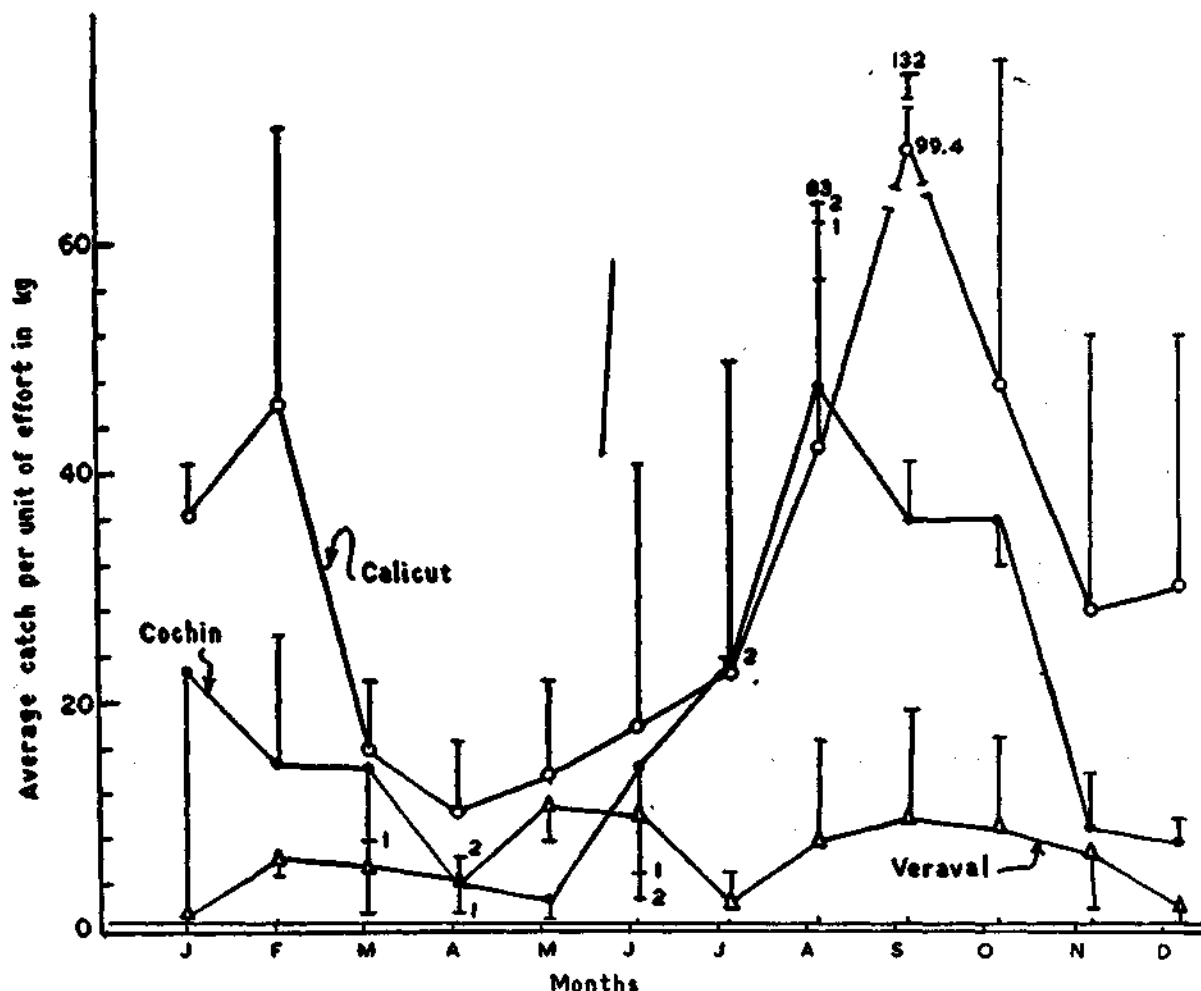


Fig. 8 Average catch per unit effort of catfish landings by gill nets during different months at Veraval, Calicut and Cochin.



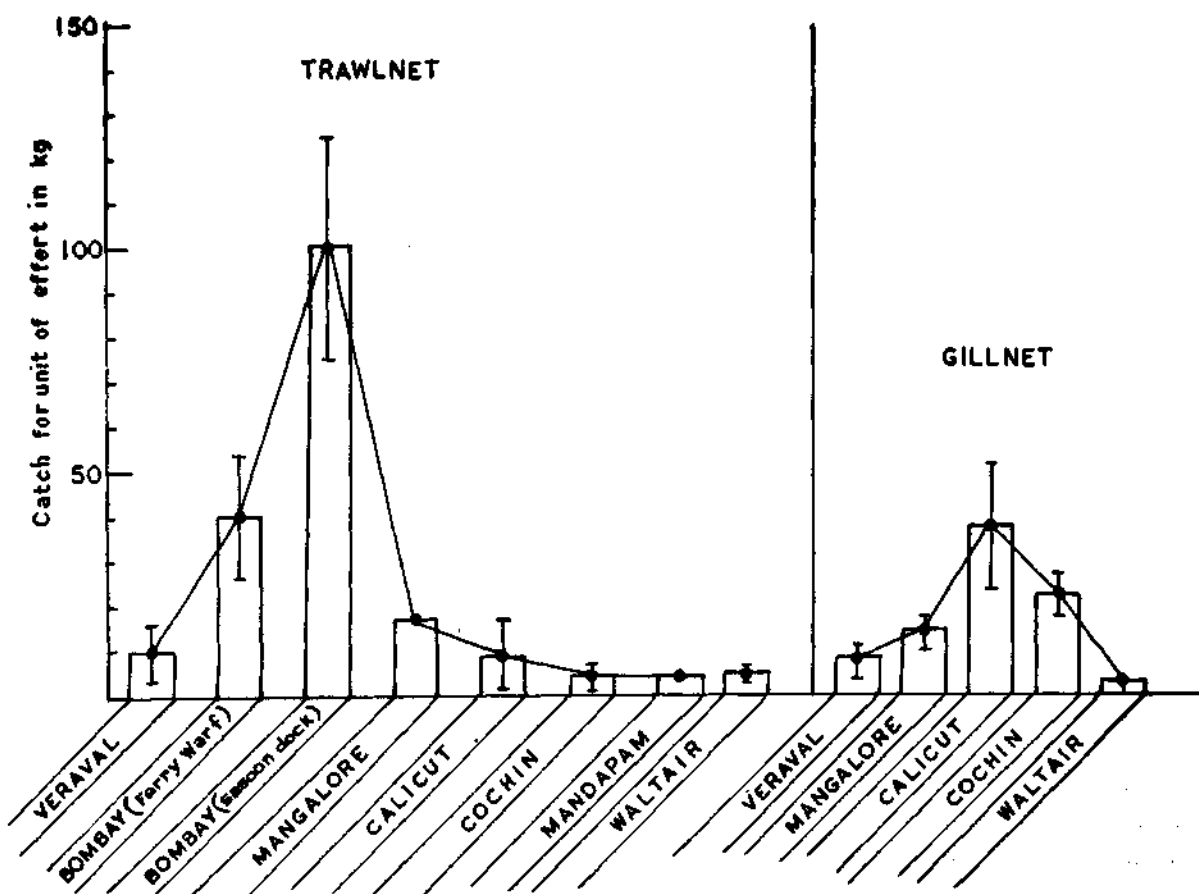


Fig 9 Gear-wise annual average catch per unit effort of catfish landings at different centres.

### South East Region

Of the several species of catfishes occurring in the catches along the southeast coast of India, only a few species are economically important, forming substantial fishery at one centre or the other. Though eight species occur along the Palk Bay and Gulf of Mannar, only *T. thalassinus* (50%) *T. dussumieri*, *T. caelatus* and *T. platystomus* are the regular components of trawl catches. Species such as *T. thalassinus*, *T. maculatus* and *O. militaris* are common in Palk Bay, whereas *T. platystomus* is abundant in the Gulf of Mannar. In the drift net catches the dominant species are *T. dussumieri* and *T. caelatus*.

### South West Region

The major species contributing to the fishery in SW region, comprising Kerala and Karnataka coasts, are *T. thalassinus*, *T. tenuispinis*, *T. dussumieri* and *T. serratus*. However, occasionally *T. maculatus* is also

recorded in large quantities from nearshore waters. The abundance of various species differ seasonally and from gear to gear. Along southern Kerala, *T. thalassinus* and *T. serratus* are common in hooks & line and drift net landings. In trawl-net catches *T. tenuispinis* and *T. thalassinus* are the most common species along both Cochin and Calicut, whereas *T. dussumieri* and *T. tenuispinis* dominate in the catches from southern Karnataka (Table 28 & 29). The species composition sometimes varies from year to year, depending on the availability and the migration of shoals (Table 25). The drift gill nets show altogether a different trend, in that *T. dussumieri* and *T. tenuispinis* are common along northern Kerala, as against *T. thalassinus*, *T. dussumieri* and *T. serratus*, the major species caught at Cochin (Tables 26 & 27). In South Karnataka *T. serratus*, *T. tenuispinis* and *T. dussumieri* are the major contributors in the gill-net catches (Table 30). The hooks & line catches of northern Kerala are mostly of *T. tenuispinis*, next in abundance being *T. thalassinus* and *T. dussumieri*.

## North West Region

A number of species, such as *T. thalassinus*, *T. dussumieri*, *T. tenuispinis*, *T. sona*, *T. caelatus*, *T. maculatus* and *O. militaris* occur along North-west Region. The yield of different species in trawl net varies from year to year; however, *T. dussumieri* and *O. militaris* are commonly caught by trawl net at Veraval (Table 31, 32 and 33). Similarly, in drift net also there are yearly fluctuations in species dominance, but in general *T. dussumieri* makes the major contribution (Table 34, 35, 36). Of the six species of catfishes occurring along the Maharashtra coast, *T. sona* contributes about 60% to the catfish catch (Singh and Rege, 1968), *T. dussumieri*, *T. tenuispinis*, *T. serratus* and *T. thalassinus* in decreasing order contribute to the catches of different gears operated along the Goa coast.

From the foregoing account it may be seen that *T. thalassinus*, which is more abundant all along the east coast and southern Kerala, shows a diminishing trend northward from central Kerala. *O. militaris* and *T. caelatus* exhibit a discontinuous distribution along the coasts. They are common in Palk Bay and in Veraval. There is a fishery for *O. militaris* also in the Hoogly estuary in West Bengal. *T. tenuispinis* and *T. dussumieri* are of a highly migratory nature and are found all along the coasts of India with abundance in South West region. *T. serratus* is distributed all along the coasts but forms a regular fishery only in South-west region.

## DEPTHWISE DISTRIBUTION

Catfishes are mostly abundant in shallower waters, of less than 50 m depth. Nagabhushanam (1966) described the depthwise distribution of catfishes along the Andhra Pradesh and Orissa coasts between lat. 17°00' N and 20°00' N and long 82° 20' E and 86° 40' E. His study has shown that larger catfishes are caught more from deeper waters. Rao *et al.* (1972) has studied the depth distribution of catfishes along the lat. 15°00' N to 22°00' N and found that the catch

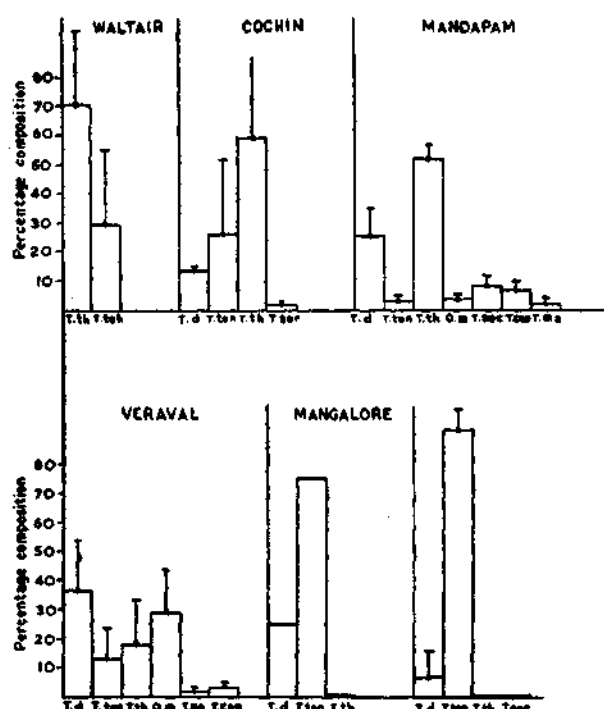


Fig. 10 Centre-wise species composition of catfish landings in percentage with standard deviation from trawl net.  
(Below right extreme is Calicut)

rates are high from all depths (5 to 85 m), but with higher concentrations in 41-60 m depths in all latitude zones. Nagabhushanam's (1966) observation is almost in close agreement with that of Sekharan's (1973) on the depthwise distribution of catfishes along the north western Bay of Bengal. Sekharan (1973) has reported that, on an annual average, *T. thalassinus* and *T. tenuispinis* have two peak abundances in two depth ranges, the first being 30-50 m and the second 60-80 m. Both the species have high abundance in shallow grounds (less than 50 m depth) in April-June and October-December and in deeper grounds in July-September. In September-December period the sizes of both species increase with increase in depth. Rao *et al.* (1977), based on acoustic surveyes and fishing results of R. V. Rastrelliger and R. V. Sardinella of P F P, reported that the catfish catches are moderately high up to a depth of 50 m in the Gulf of Mannar.

TABLE 23

*Details of operations of gillnet with respect to total all-fish landings and total catfish landings in tonnes at Veraval during 1980-1982.*

	January	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	Total
<b>1980</b>													
All fish	612	282	7510	486	372	201	—	274	370	443	8135	322	19007
Catfish	34	20	32	8	34	5	—	18	10	84	136	5	386
% of catfish	5.55	7.09	0.43	1.65	9.14	2.49	—	6.57	2.70	18.96	1.67	1.55	2.03
Effort in units	4792	1624	3256	2970	3162	1230	—	1240	2700	3472	8010	2542	34998
CPUE of catfish (kg)	7.09	12.31	9.83	2.69	10.75	4.06	—	14.52	3.70	24.19	16.98	1.97	11.03
<b>1981</b>													
All fish	463	151	183	114	490	123	49	0	469	143	195	72	2452
Catfish	40	1	5	23	99	42	2	0	38	11	3	0	264
% of catfish	8.64	0.66	2.73	20.17	20.20	34.15	4.08	0	8.10	7.69	1.54	0	10.77
Effort in units	4278	560	1581	1560	4371	510	248	0	3060	2280	2100	1209	21757
CPUE of catfish (kg)	9.35	1.78	3.16	14.74	22.65	82.35	8.06	0	12.42	4.82	1.43	0	12.13
<b>1982</b>													
All fish	123	339	256	397	804	246	0	10	459	642	22	459	3757
Catfish	10	10	14	69	174	51	0	0	34	58	0	21	441
% of catfish	8.13	2.95	5.47	17.38	21.64	20.73	0	0	7.41	9.03	0	4.57	11.74
Effort in units	1931	2698	1584	3960	5115	480	0	248	4320	3765	746	3455	28302
CPUE of catfish (kg)	5.18	3.71	8.84	17.42	34.02	106.25	0	0	7.87	15.40	0	6.08	15.58

TABLE 24

*Species composition of Catfish*

Gear: Trawlnet Centre: Visakhapatnam  
Fishing Harbour

Month	T. thalassinus (%)	T. tenuispinis (%)	Total in Kg.
Year: 1980			
Jan	1320 (3.3)	39680 (96.7)	40000
Feb	46231 (55.7)	36769 (44.3)	83000
Mar	10656 (66.6)	5344 (33.4)	16000
Apr	0	0	0
May	0	0	0
Jun	0	0	0
Jul	0	2000 (100.00)	2000
Aug	472 (47.2)	528 (52.8)	1000
Sept	13432 (58.4)	9568 (41.6)	23000
Oct	10990 (78.5)	3010 (21.5)	14000
Nov	3000 (100.0)	0	3000
Dec	9810 (65.4)	5190 (34.6)	15000
Total	95911 (48.7)	101089 (51.3)	197000

Year : 1981

Jan	12325 ( 49.3)	12675 (50.7)	25000
Feb	7776 ( 64.8)	4224 (35.2)	12000
Mar	6510 (93.0)	490 (7.0)	7000
Apr	1802 (90.1)	198 (9.8)	2000
May	15938 (61.3)	10062 (38.7)	26000
Jun	7904 (41.6)	11096 (58.4)	19000
Jul	12260 (61.3)	7740 (38.7)	20000

1981 Contd.

Month	T. thalassinus (%)		T. tenuispinis (%)		Total in kg
Aug	2000	(100.0)	0		2000
Sept	6171	(56.1)	4829	(43.9)	11000
Oct	9984	(76.8)	3016	(23.2)	13000
Nov	8490	(84.9)	1510	(15.1)	10000
Dec	2832	(94.4)	168	(5.6)	3000
Total	93992	(62.7)	56008	(37.3)	150000

Year : 1982

Jan	16000	(100.0)	0		16000
Feb	17995	(94.5)	1045	(5.5)	19000
Mar	14176	(88.6)	1824	(11.4)	16000
Apr	4472	(55.9)	3528	(44.1)	8000
May	4400	(88.0)	600	(12.0)	5000
Jun	2534	(36.2)	4466	(63.8)	7000
Jul	12958	(68.2)	6042	(31.8)	19000
Aug	29954	(88.1)	4046	(11.9)	34000
Sep	35820	(99.5)	180	(0.5)	36000
Oct	3542	(50.6)	3458	(49.4)	7000
Nov	25732	(91.9)	2268	(8.1)	28000
Dec	21230	(96.5)	770	(3.5)	22000
Total	188773	(87.8)	28227	(12.2)	217000

TABLE 25

*Species composition of catfish*

Gear : Trawl-net

Centre: Cochin Fishing Harbour

Month	T. dussumieri %		T. thalassinus %		T. serratus %		T. tenuispinis %		Monthly total
Year : 1981									
January			No data available						1000
February			—						Nil
March			—						1000
April			—						5000
May	18321	26.17	29616	42.31	2772	3.96	19291	27.56	70000
June	—	—	2426	3.62	—	—	64574	96.38	67000
July	—	—	17061	23.06	—	—	56939	76.94	74000
August			No data available						27000
September	—	—	285	5.70	—	—	4715	94.30	5000
October	—	—	—	—	—	—	—	—	—
November	—	—	—	—	—	—	—	—	—
December	3000	100.00	—	—	—	—	—	—	3000
Total	21,321	8.43	49,388	19.52	2,772	1.1	150,519	59.49	25,3000
Year : 1982									
January	—	—	—	—	—	—	—	—	—
February	—	—	—	No data available				—	2000
March	4642	92.84	305	6.10	53	1.6	—	—	5000
April	—	—	—	—	—	—	—	—	NIL
May	—	—	—	No data available				—	10000
June	—	—	72710	49.46	72710	49.46	1580	1.08	147000
July	—	—	—	—	—	—	—	—	7000
August	—	—	50000	100.00	—	—	—	—	50000
September	—	—	53000	100.00	—	—	—	—	53000
October	—	—	1000	100.00	—	—	—	—	1000
November	—	—	—	No data available				—	6000
December	—	—	—	—	—	—	—	—	—
Total	4642	1.65	177,015	62.99	72,763	25.89	1580	0.56	281000

TABLE 26

*Species composition of Catfish*

Year : 1981

Gear : Gillnet (Drift)

Centre : Cochin Fishing Harbour

Months	<i>T. dussumieri</i>	%	<i>T. thalassinus</i>	%	<i>T. serratus</i>	%	<i>T. tenuispinis</i>	%	Monthly total
January	27044	97.87	283	1.01	307	1.10	6	0.02	28000
February	20618	98.18	218	1.04	164	0.78	—	—	21000
March	27239	97.28	458	1.64	301	1.08	2	—	28000
April	3555	88.87	12	0.30	433	10.83	—	—	4000
May	1275	42.50	40	1.34	1678	53.93	7	0.23	3000
June	5292	13.93	1800	4.74	30625	80.59	283	0.74	38000
July	10061	14.79	3621	5.33	45015	66.20	9303	13.68	68000
August	37385	41.54	8106	9.01	37534	41.70	6975	7.75	90000
September	12321	22.82	15187	28.12	15173	28.10	11319	20.96	54000
October	11559	36.12	6405	20.02	11946	37.33	2090	6.53	32000
November	12879	67.79	928	4.88	5086	26.77	107	0.56	19000
December	3756	93.90	31	0.78	213	5.32	—	—	4000
Total	173344	44.56	37089	9.54	184475	38.17	30092	7.73	389000

TABLE 27

*Species composition of catfish*

Year : 1982

Gear : Gillnet (Drift)

Centre : Cochin Fishing Harbour

Months	<i>T. dussumieri</i>	%	<i>T. thalassinus</i>	%	<i>T. serratus</i>	%	<i>T. tenuispinis</i>	%	Monthly total
January	969	96.90	31	3.10	—	—	—	—	1000
February	1852	92.60	124	6.20	24	1.20	—	—	2000
March	3390	84.75	240	6.00	370	9.25	—	—	4000
April	411	41.70	66	6.60	523	52.30	—	—	1000
May	—	—	—	—	—	—	—	—	NIL
June	1083	13.54	2621	32.76	3971	49.64	325	4.06	8000
July	32274	29.61	13524	12.41	59610	54.69	3592	3.29	109000
August	19961	20.58	11681	12.04	41305	42.58	24053	24.80	97000
September	17928	22.98	24242	31.08	32252	41.35	3578	4.59	78000
October	3472	9.14	17205	45.28	16656	43.83	667	1.75	38000
November	2360	59.00	696	17.40	919	22.98	25	0.63	4000
December	1686	84.30	26	1.30	288	14.40	—	—	2000
Total	85386	24.82	70456	20.48	155918	45.33	32240	9.37	344000



TABLE 28

*Species composition of catfish in the catches of trawlers and  
pursesainers at Mangalore in 1982*

Gear : Trawl-net

Month	<i>T. dussumieri</i>	<i>T. tenuispinis</i>	<i>T. thalassinus</i>	Monthly total in kg.
January	No data available			
February	—do—			
March	—do—			
April	59116	0	0	59116
May	47090	85030	0	112120
June	275	617	420	1312
July	0	0	0	0
August	0	0	0	0
September	0	0	0	0
October	0	0	0	0
November	0	166294	0	166294
December	0	88635	0	88635
Total	106481	320576	420	427477
%	24.9	75.0	0.1	

Gear : Purse-seine

Month	<i>T. dussumieri</i>	<i>T. tenuispinis</i>	Total catch in Kg.
January	No data available		494000
February	—do—		616000
March	—do—		138000
April	334000	0	334000
May	3149000	0	3149000
June	0	0	0
July	0	0	0
August	0	0	0
September	0	273000	273000
October	431641	659359	1127000
November	11000	0	11000
December	0	0	0
Total	3925641	968359	6142000
%	80.21	19.78	

TABLE-29

*Species composition of Catfish landed by Drift-gill net during 1982-1983 South Kanara.*

Year : 1982

	September Catch % kg		October Catch %		November Catch %		December Catch %	
<i>T. serratus</i>	11839	23.54	23265	27.37	5564	21.81	11668	23.7
<i>T. thalassinus</i>	4841	9.63	8144	9.58	1720	6.74	3019	6.14
<i>T. dussumieri</i>	6241	12.41	26196	30.82	4091	16.04	9824	19.96
<i>T. tenuispinis</i>	27372	54.43	27405	32.24	14135	55.41	24698	50.19
Total	50293		85010		25510		49209	
Effort units	2365		7211		6287		6832	

Year : 1983

	January Catch %		February Catch %		March Catch %		April Catch %		Annual Catch %	
<i>T. serratus</i>	20604	70.75	9195	43.38	6861	4090	—	—	88966	31.93
<i>T. thalassinus</i>	389	1.34	17	0.08	—	—	—	—	18130	6.50
<i>T. dussumieri</i>	5469	18.78	9425	44.61	8428	5024	1563	100	71237	25.57
<i>T. tenuispinis</i>	2660	9.13	2522	11.94	1488	8.86	—	—	100280	36.00
Total	29122		21129		16777		1563		278613	
Effort units	4185		2159		1435		202		30676	

At Mangalore catfish project was initiated from 1982 (April) by that time the drift-gill net operations were over. It was resumed from Sept. onwards. To give a monthly species-composition picture for a year data of June-April of 1983 is included.

TABLE-30

Year : 1980

Species composition of catfish

Gear : Trawl-net

Centre : Veraval

Month	<i>T. dussumieri</i>	<i>T. caelatus</i>	<i>T. sona</i>	<i>T. thalassinus</i>	<i>T. tenuispinis</i>	<i>O. militaris</i>	Total in kg
January	93200	3000	1000	3400	46800	52600	2,00,000
February	54450	—	—	52950	—	42600	1,50,000
March	14224	—	—	2352	4368	7056	28,000
April	54120	5016	—	—	11220	61644	1,32,000
May	224120	—	—	—	—	35880	26,000
June	—	—	—	—	—	—	—
July							
August							
September							
October	6688	—	—	656	8000	656	16,000
November	10374	—	—	1680	1785	7161	21,000
December	—	—	—	—	—	—	—
Total	457176	8016	1000	61038	72173	207597	8,07,000
%	56.7	1.0	0.1	7.6	8.9	25.7	

TABLE-31

Year : 1981

Species composition of Catfish

Gear : Trawl-net

Centre : Veraval

Month	<i>T. dussumieri</i>	<i>T. tenuispinis</i>	<i>T. thalassinus</i>	<i>T. caelatus</i>	<i>O. militaris</i>	Total in kg
January	5016	—	4422	—	56562	66,000
February	—	—	11700	—	6300	18,000
March	—	—	—	—	—	—
April	4389	—	8550	—	44061	57,000
May	21276	—	4806	648	27270	54,000
June	—	—	—	—	—	—
July						
August						
September	—	—	—	—	5000	5,000
October	9696	786	—	192	13344	24,000
November	630	—	38520	4770	46080	90,000
December	21175	—	65582	—	34243	1,21,000
Total	62182	768	133580	5610	232860	4,35,00
%	14.3	0.2	30.6	1.3	53.5	

TABLE 32

Year : 1982

Species composition of catfish

Gear : Trawl-net

Centre : Veraval

Month	<i>T. dussumieri</i>	<i>T. tenuispinis</i>	<i>T. thalassinus</i>	<i>T. sona</i>	<i>T. caelatus</i>	<i>O. militaris</i>	Total in kg.
January	—	—	70564	—	—	21436	92,000
February	1496	—	8382	—	—	1122	11,000
March	959	1260	2723	77	—	1981	7,000
April	84727	15440	38407	—	—	54426	1,93,000
May	40934	—	—	—	—	56066	97,000
June	1000	—	—	—	—	—	1,000
July	—	—	—	—	—	—	—
August	—	—	—	—	—	—	—
September	105196	228956	—	53312	10948	77598	4,76,000
October	115200	27456	45312	—	—	4032	1,92,000
November	—	232	136	—	—	7632	8,000
December	1254	1914	20592	—	—	9240	33,000
Total	350766	275258	186116	53389	10948	233523	11,10,000
%	31.6	24.8	16.8	4.8	1.0	21.0	—

TABLE 33

Year : 1980

Species composition of catfish

Gear : Gillnet

Centre : Veraval

Month	<i>T. dussumieri</i>	<i>T. caelatus</i>	<i>T. sona</i>	<i>T. thalassinus</i>	<i>T. maculatus</i>	<i>T. tenuispinis</i>	<i>O. militaris</i>	Others	Total in kg.
January	12682	306	374	5100	—	6596	8942	—	34,000
February	16040	—	—	—	—	1060	2900	—	20,000
March	18880	—	576	1312	—	8000	3232	1	32,000
April	7712	—	—	—	—	32	256	—	8,000
May	23120	1462	—	—	680	8738	—	—	34,000
June	4695	305	—	—	—	—	—	—	5,000
July	—	—	—	—	—	—	—	—	—
August	18000	—	—	—	—	—	—	—	18,000
September	10000	—	—	—	—	—	—	—	10,000
October	78708	—	—	840	—	4452	—	—	84,000
November	85540	—	—	11424	—	34000	5032	—	1,36,000
December	3665	—	—	—	—	110	1225	—	5,000
Total	279046	2073	950	18676	680	62988	21587	—	3,86,000
%	72.3	0.5	0.3	4.6	0.2	16.3	5.6	—	—

TABLE 34

*Species composition of catfish*

Gear : Gillnet

Centre : Veraval

Month	<i>T. dussu-</i> <i>mieri</i>	<i>T. tenuis-</i> <i>pinis</i>	<i>T. thalassi-</i> <i>nus</i>	<i>T. sona</i>	<i>T. caelatus</i>	<i>O. militaris</i>	Others	Total in kg.
Year : 1981								
January	37960	—	—	—	—	2040	—	40,000
February	773	—	227	—	—	—	—	1,000
March	4880	—	—	—	—	—	120	5,000
April	22494	—	506	—	—	—	—	23,000
May	77715	9207	—	6030	3960	2079	—	99,000
June	30430	2772	—	—	—	—	798	42,000
July	2000	—	—	—	—	—	—	2,000
August	—	—	—	—	—	—	—	—
September	—	—	—	26904	—	11096	—	38,000
October	—	4572	—	4572	1496	—	—	11,000
November	—	—	1992	—	336	672	—	3,000
December	—	—	—	—	—	—	—	—
Total	184252	16731	2725	37695	5792	16685	120	2,64,000
%	69.8	6.3	1.0	14.3	2.2	6.3	0.1	

Year : 1982

January	1970	—	5830	—	—	2200	—	10,000
February	5130	340	4460	—	—	70	—	10,000
March	13384	—	616	—	—	—	—	14,000
April	69000	—	—	—	—	—	—	69,000
May	135024	—	—	—	38976	—	—	1,74,000
June	50439	—	—	561	—	—	—	51,000
July	}	—	—	—	—	—	—	—
August		—	—	—	—	—	—	—
September	27744	—	—	—	2652	—	3604	34,000
October	51736	6264	—	—	—	—	—	58,000
November	—	—	—	—	—	—	—	—
December	16128	—	—	—	—	4872	—	21,000
Total	370555	6604	10906	561	41628	7142	3604	4,41,000
%	75.2	3.7	9.7	0.1	5.5	5.3	0.6	

## DISCUSSION

The monthwise average catch rates of trawl nets at different centres are given in Fig. 7. Though catfishes are available along both the coasts almost throughout the year, better abundance is noticed during the premonsoon months along Gujarat, Karnataka and Kerala coasts. The gill-net landings at Calicut and Cochin show an identical picture, where the catch rate is uniformly good in all the months except March-July period (Fig 8). Along Gujarat coast also the gill net shows a similar trend in catch rates. The centrewise average annual catch rate of trawl and gill nets shows an increase from Veraval to Bombay and decline further southwards. The data from the various centres on catch rate suggest that the abundance of catfish is better along the west coast, especially off Gujarat, northern Maharashtra and northern Kerala.

Exploratory fishing operations on the shelf in the Goa-Gujarat region (15° to 24° N lat. and 67° E to 74° E long.) has shown that the catfish yields are of a high magnitude in the first and fourth quarters. Even though

the catch in the third quarter is poor, the catch rate is highest, indicating a high abundance of catfish. during the third quarter. Of the various centres in the area, Kutch and Porbunder yield the maximum catch rates; similarly, rich grounds of catfishes are located off Malvan and Marmagao. It is roughly estimated that the potential sustainable yield from this region is 4,254 tonnes, as against an annual average catch of 1,091 tonnes (Rao *et al.*, 1972; Rao and Dorairaj, 1968). Surveys carried out by the Pelagic Fishery Project has given an estimate of 15,629 tonnes of catfish biomass for southern Maharashtra, which is 7.6 times higher than the average landings of this region (Rao *et al.*, 1977).

Exploratory fishings conducted by Government of India, Indo-Norwegian Project and Pelagic Fishery Project vessels have revealed that rich catfish grounds are present between 7° 30' N and 15° N lat. and 73° 40' E and 77° 33' E long. Bull-trawling operations has shown that catfishes are abundant in the Cannanore-Calicut belt, but the intensity decreases along the Cochin-Alleppey belt and altogether diminishes further south. Pelagic

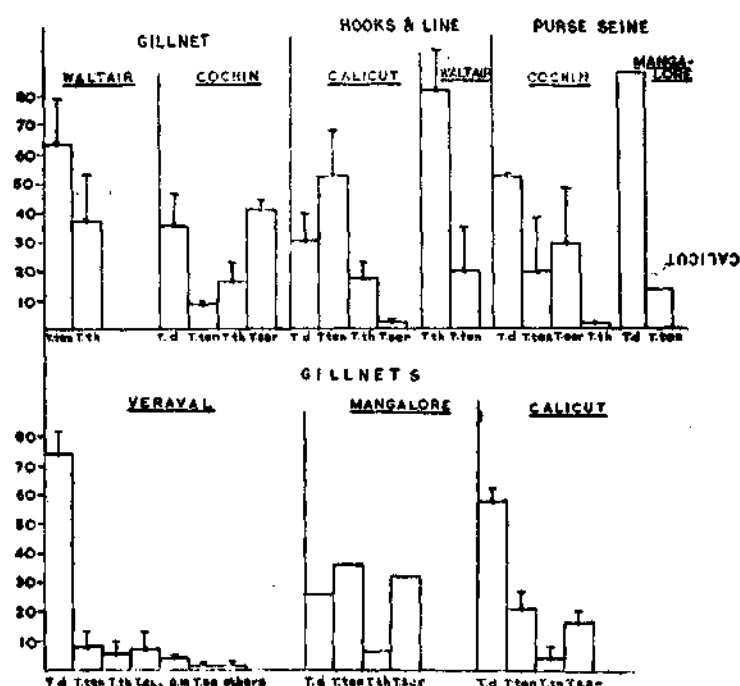


Fig. 11 Centre-wise species composition of catfish landings in percentage with standard deviation from Gill net, Hooks and line and Purse-seine.

Fishery Project surveys have shown that the second and third quarters are the periods of highest abundance of catfish along Kerala and Karnataka. The highest estimated average biomass of catfish along the coast of Kerala is 3.6 times higher than the average landings (Rao *et al.*, 1977).

Offshore surveys by trawls, gill nets and hooks & lines along the south-east coast has shown that, after silverbellies, catfish is the important resource (2 to 8%) in the Plak Bay. By acoustic surveys in the Gulf of Mannar, the P. F. P. has estimated the average biomass of catfish to be 2.3 times higher than the average landings.

The exploratory trawl operations along

the north-east coast has revealed that, on an average, 9.24% of the annual trawl catches consist of catfishes. *Tachysurus* in fact, constitutes the largest single generic group in the trawl catches. The exploratory trawling operations by M. T. Ashok in the area 16° 40' N lat. has revealed that the estimated catfish resource, by 'swept area' method (Gulland, 1965) is 23,484 tonnes and potentially sustainable yield, at 60% level, 14,090 tonnes.

Coming to the specieswise abundance, the average percentage composition of different species of catfish in different regions in trawl catches is given in Fig 11. The species of *Tachysurus* which are dominant in each gear at various centres are as follows:

Centres	Trawl net	Gill net	Hooks & Line	Purse seine
Waltair	<i>T. thalassinus</i>	<i>T. tenuispinis</i>	<i>T. thalassinus</i>	-
Mandapam	<i>T. thalassinus</i>	-	-	-
Cochin	<i>T. thalassinus</i>	<i>T. dussumieri</i> & <i>T. serratus</i>	-	<i>T. dussumieri</i>
Calicut	<i>T. tenuispinis</i>	<i>T. dussumieri</i>	<i>T. tenuispinis</i>	-
Mangalore	<i>T. tenuispinis</i>	<i>T. tenuispinis</i>	-	<i>T. dussumieri</i>
Veraval	<i>T. dussumieri</i>	<i>T. dussumieri</i>	-	-

Central Marine Fisheries Research Institute has estimated a potential yield of 310,000 tonnes of catfish as against an annual

average yield of 58,000 tonnes from the Indian Seas which is next to Oceanic tunas (500,000 tonnes).

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